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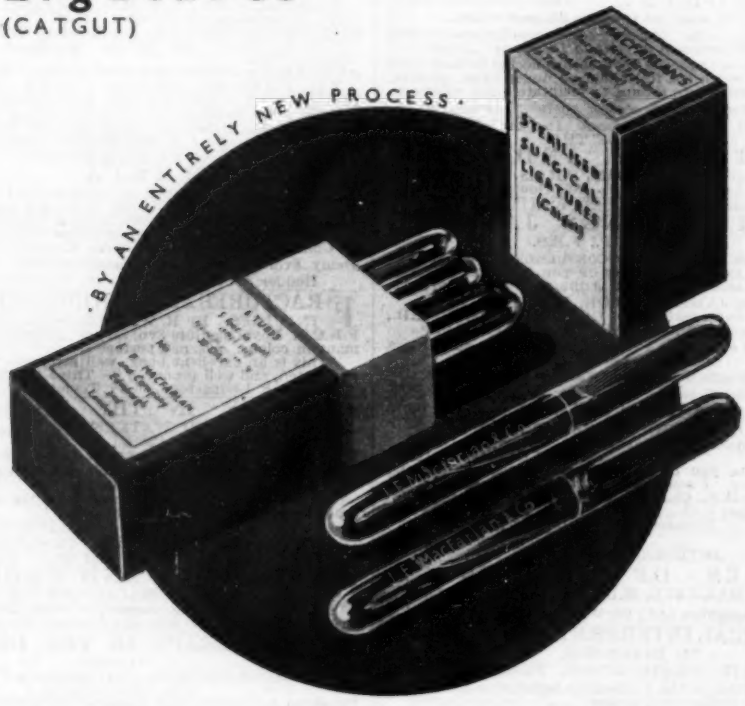

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CONTENTS

THE WHOLE OF THE LITERARY MATTER IN THE LANCET IS COPYRIGHT

ADDRESSES AND ORIGINAL ARTICLES

Rickettsia Diseases of Malaya: Identity of Tsutsugamushi and Rural Typhus. By R. LEWTHWAITE, M.R.C.P., and S. R. SAVOOR, M.B.—I. (*illus.*) 255

Recurrent Traumatic Herpes. By G. M. FINDLAY, M.D., and F. O. MACCALLUM, M.D. 259

Dosage of Sulphanilamide Derivatives for Children. By MARTIN HYNES, M.R.C.P. (*with charts*) .. 261

Tuberculosis in Medical Students: Diagnostic Service at University College Hospital Medical School. By P. D'ARCY HART, F.R.C.P., GWEN HILTON, M.B., D.M.R.E., and ANDREW MORLAND, M.R.C.P. (*illustrative plates*) 263

Hemiplegia Complicating Sodium Diphenyl Hydantoinate Therapy of Epilepsy. By DONALD BLAIR, M.B. (*with chart*) 269

MEDICAL SOCIETIES

MEDICAL SOCIETY OF LONDON:

Physiological Problems of Human Flight 270

REVIEWS OF BOOKS

Gynæcology. By Herbert H. Schlink, F.R.A.C.S... 271

The Louse. By Prof. Patrick A. Buxton, L.R.C.P. 271

Asthma and the General Practitioner. By James Adam, F.R.F.P.S. 272

British Journal of Surgery 272

THE LANCET 100 Years Ago 300

LEADING ARTICLES

DIPHTHERIA NOT PREVENTED 273

THE BLOOD CELLS' FAMILY TREE 274

CHILDREN'S TEETH 274

ANNOTATIONS

Primum non Nocere 275

Carbohydrates and Staphylococcal Infections 275

Big Hearts of Doubtful Origin 276

A Godfather of the Microscope 276

Inheritance of an Acquired Characteristic? 276

A State Experiment in Chemical Research 277

Preludes to Anæsthesia 277

Carcinoma of the Cervical Stump 277

The Prescription of Aspirin 278

Margarine 278

Ten Years Matron-in-Chief to the L.C.C. 278

THE PROBLEM OF ADOLESCENCE

By HENRY YELLOWLEES, F.R.C.P.—II. 279

OBITUARY

Fritz de Quervain, M.D. (*with portrait*) 297

Alexander Dingwall-Fordyce, F.R.C.P.E. 297

Richard Henslowe Wellington, M.R.C.S. 298

Henry George Armstrong, M.R.C.S. 298

Albert Samuel Worton, F.R.C.S. 298

Surgeon Captain P. D. Ramsay 298

Index to THE LANCET, Vol. II, 1939 278

SPECIAL ARTICLES

Social Environment and the War 285

Tests of Hearing 286

Child Guidance 287

Medicine and the Law: "During His Majesty's Pleasure"; Insecticide for Liquorice Powder .. 287

Scotland: The Waste of Child Lives; Scottish Students and Conscription 288

In England Now 289

LETTERS TO THE EDITOR

Visiting in Children's Wards (Dr. John Bowlby) 291

The Case for a Rehabilitation Board (Dr. F. Temple Clive) 291

The Future of Clinical Teaching (Sir C. Gordon-Watson, F.R.C.S.) 291

The Mind of Hitler (Dr. G. H. Crisp and Dr. T. A. Ross) 292

The Advisory E.M.S. Committee (Dr. G. C. Anderson) 292

A Filing Service in France (Mr. H. Dalby) 293

Exo-Erythrocytic Stage of Malaria (Prof. G. Bastianelli) 293

Students and the E.M.S. (Mr. R. P. G. Sandon) ... 293

PUBLIC HEALTH

Bacillary Dysentery in an Emergency Hospital. By R. B. McMillan, M.R.C.P.E., W. Hunter, M.B., and A. J. Rhodes, M.R.C.P.E. 282

Influenza and Pneumonia .. 284

Infectious Disease in England and Wales 285

PARLIAMENT

On the Floor of the House. 294

From the Press Gallery: Workmen's Compensation—Control of Food Prices 295

Question Time: University Students and Military Service; Women Doctors in the Army; Medical Treatment for the Shipwrecked; Feet of Soldiers; Nursery Centres; Return of Evacuated Children to London; the Penalty of Prophylaxis; Young Persons on Night-work; Juvenile Delinquency; Judge or Medical Referee? Chickens and Eggs for Convalescents; Price of Saccharin 295

MEDICAL NEWS

University of Cambridge.. 299

University of Manchester.. 299

Scottish Conjoint Board... 299

Harveian Society 299

Chadwick Lectures 299

Pharmaceutical Society ... 299

Druggists' Gifts for Earthquake Victims 299

Allocation of Doctors to the Services 299

More Appointments for Outpatients 300

Socialist Medical Association 300

NOTICES

The Hand of the Surgeon. By C. J. S. THOMPSON... 301

Social Hygiene 301

Liverpool School of Tropical Medicine 302

New Preparations: Neopepsac—Kapilon—Ferræmia Tablets 302

Some Medical Antiques.... 262

Medical Diary, Births, Marriages and Deaths..... 300

Appointments—Vacancies. 302

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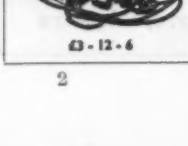

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ADDRESSES AND ORIGINAL ARTICLES

RICKETTSIA DISEASES OF MALAYA

IDENTITY OF TSUTSUGAMUSHI AND RURAL TYPHUS

BY R. LEWTHWAITE, D.M. Oxfd, M.R.C.P., AND S. R. SAVOOR, M.B. Madras

(*From the Division of Pathology, Institute for Medical Research, Kuala Lumpur, F.M.S.*)

I

THE object of this paper is twofold: to describe tsutsugamushi, which although tropical is closely linked with diseases well known in non-tropical countries; and to try to eradicate the terms "rural typhus" and "scrub typhus."

Fletcher and Lesslar (1925), by serological and epidemiological studies, first proved that typhus-like fevers existed in British Malaya; these differed from classical typhus in that they did not flare up in epidemics and were not louse-borne. The last decade has seen a remarkable increase in knowledge of the typhus-like fevers throughout the world. From almost every British dominion and colony, from at least seven European countries, from the Mediterranean littoral, from North and South America, and from the Far East have come reports of endemic fevers showing characteristics of the typhus group. Gray, Peters, and Davies (1938) reported a human infection of this type acquired in the port of Bristol.

These discoveries have led to confusion in classification owing to apparent differences in clinical signs, serology, case-mortality, or epidemiology. By international coöperation between laboratory workers many diagnostic criteria have been established, and the existence of a few cardinal groups of typhus fevers has been demonstrated. Much confusion still remains, however, especially between tsutsugamushi, rural typhus (scrub typhus), Sumatran mite fever, and urban typhus (shop typhus). Urban typhus is a flea-borne endemic disease, of the X 19 serological type, found the world over; we have shown that it belongs to a group of rickettsial diseases differing widely from the tsutsugamushi-rural typhus group (Lewthwaite and Savoor, 1936e). A laboratory investigation we have nearly completed suggests that the differences between Sumatran mite-fever and tsutsugamushi are no more than those that may distinguish two strains of any organism.

We are convinced that tsutsugamushi and rural typhus are identical, and that rural typhus can no longer be considered a disease sui generis; hence the term should be discarded. We rely largely on our study of 250 patients seen during the past ten years. Of these, 181 were in or near the town of Kuala Lumpur; hence we were able to observe the course of the disease daily to its termination and to investigate it in ward, laboratory, and post-mortem room. The percentages given below refer to these Kuala Lumpur patients. The rest were seen by us in consultation, and were therefore visited less often. Of the total, 15 were Europeans, the rest Asiatics.

DEFINITION

Tsutsugamushi is an acute infection caused by the *Rickettsia orientalis* (*R. nipponica*, *R. tsutsugamushi*). The onset is abrupt, with fever and severe headache; a macular and papular rash appears about the fifth day; and the termination is either by crisis or lysis at the end of the second week. It is conveyed by the bite of a larval trombidiid; a variable dermal lesion develops at the site of inoculation. Clinically it resembles typhus exanthematicus and other typhus-like fevers: in epidemiology it differs from them widely.

INCIDENCE

In Japan the disease has long been endemic, but it is also common in British Malaya and Formosa. The coastal fever of Queensland appears to be identical with tsutsugamushi; Unwin (1935) reported a series of 1500 cases, and the clinical, serological and epidemiological features were so similar to those of tsutsugamushi that his conclusion that the disease was a mite-borne typhus was inevitable. There is little doubt that ætiological and cross-protection studies will ultimately prove the identity of this mite-borne typhus with tsutsugamushi and rid the nomenclature of yet another superfluous term. Other endemic foci of tsutsugamushi are Indo-China and the Philippine Islands, and from the Dutch East Indies have been reported some hundreds of cases of pseudo-typhus or Sumatran mite fever.

In Malaya the disease is not seasonal; every month of the year yields cases. It is in a sense occupational, for the victims show one common characteristic: they have been over country covered with lalang (a tall coarse grass, *Imperata cylindrica*) or with other undergrowth.

CLINICAL PICTURE

The few case-histories of value in the estimation of the incubation period show it to be eleven to twenty-one days. The onset is usually abrupt, symptoms

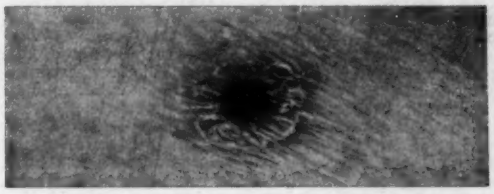

FIG. 1—The initial ulcer in man, on the upper arm, on the tenth day, showing the black scab and surrounding areola. (Giemsa.)

developing within twenty-four hours of the initial malaise. There is sometimes a prodromal period of general malaise, with mild headache lasting two to three days, rarely five days. Fever, shivering, and headache are almost invariably the first symptoms, accompanied occasionally by vomiting and by pain in the chest or all over the body.

Initial dermal lesion.—This can seldom be found. It may be no more than a papule. Only in 14 of our cases did it develop into an ulcer, and the view that the presence of an ulcer is a sine qua non of tsutsugamushi can no longer be upheld. The ulcer is merely a stage in the development of a lesion that is first macular, then papular, and only in a few cases progresses beyond this to become a necrotic ulcer. The papule usually develops and disappears during the incubation period and is therefore seldom visible when the patient seeks advice. Indeed, Schüffner (cited by Wolff 1931) in an early description of tsutsugamushi in Sumatra considered that, since he had seen the

primary ulcer in all his European patients its occasional absence in natives might be due to its having already healed.

The ulcer, when present, is typical. It consists of a black crust surrounded by a contiguous hyperæmic areola. The crust is slightly depressed below the surface and may be round or oval, measuring about 5 mm. in diameter if round or 4 × 6 mm. if oval; in one case it was only 2 mm. in diameter. The areola is 4–5 mm. broad and has a sharply defined outer margin (fig. 1). These features are typical of the lesion at the end of the first week of fever, but variations are sometimes seen. During the first three or four days of fever only part of the central crust may be black, the rest being grey, and the red areola may shade off into the adjacent skin.

Two European patients had noticed the dermal lesion during the incubation period. One said that two days before the onset of symptoms he saw on his right calf "a tiny red spot," and that "in the centre of this spot there developed a bead of white matter that eventually turned black and was surrounded by a narrow red zone." The other, whose lesion was in the scapular region, said that a week before the onset of symptoms he felt on his back "what seemed to be a small boil"; the lesion was then presumably papular.

The dermal lesions of another patient provide strong evidence of the identity of rural typhus and tsutsugamushi.

A European with a fever suspected to be of the typhus group was seen in consultation by one of us. Seven days before the onset of illness he had spent the day shooting among lalang on an estate known to be an endemic focus of both diseases. The typical syndrome of rural typhus and of tsutsugamushi was present. The blood agglutinated the OXK strain of *proteus* to a titre of 1 in 680 on the eleventh day. Defervescence by lysis was complete on the fifteenth day; but delirium was progressive, and death from cardiac failure took place on the nineteenth day.

During the first few days of illness there was in the posterior triangle of the neck a tiny red papule, abraided at its apex. The successive involvement of the lymphatic glands of the posterior triangle, anterior triangle, axilla and groin of the same side, and axilla and groin of the opposite side could be clearly followed as the illness progressed, and it left no doubt that the papule marked the portal of entry of the virus. Yet by the eighth day of illness, early in the development of the rash, the small abraded papule had entirely disappeared.

This contradicted the report of the development of the initial lesion in previous cases of tsutsugamushi in Malaya; in these the ulcer persisted with its black necrotic centre at least until the end of the third week, even in the mildest case. So insignificant and ephemeral was this lesion that it would almost certainly have escaped detection on the darker skin of an Asiatic patient. At that time the view was held that the presence of a typical black necrotic ulcer differentiated tsutsugamushi from rural typhus; no other type of primary lesion was described. Judged by this criterion the case occupied an intermediate position between the two diseases. Interpreted in the light of our recent experimental work, however, the lesion was consistent with a diagnosis of tsutsugamushi. As will be shown later, papular lesions that do not progress to ulceration have developed at the sites of experimental intradermal inoculations of the virus of tsutsugamushi into monkeys and gibbons, the resulting infections being of maximal severity.

The black crust falls off usually from the third week onwards, although fomentations may effect this earlier. A well-defined pit is left; in one patient it was visible three years later. The site of the ulcer is determined to some extent by the clothing worn. The usual dress of those traversing lalang or jungle includes stockings rolled down below the knee, shorts, and shirt open at the neck; hence the commonest sites are the calf, at the upper margin of the stocking, and the neck. It is clear that the vector, the mite, brushed from lalang to clothing in passing, crawls over the clothing and attaches itself to the first accessible spot. Other sites have been the ankle, the upper arm, and the scapular region.

An apparently similar dermal lesion is found in certain other typhus fevers—e.g., the *fièvre boutonneuse* of the Mediterranean littoral. Prof. M. Ciuca, of Bucharest, familiar with this disease, saw one of our cases of tsutsugamushi in consultation and considered that the dermal lesions of the two diseases were indistinguishable.

Lymphatic glands.—In 40 per cent. of patients in whom a primary ulcer cannot be found the lymphatic glands of both axilla and groin are enlarged. In some the epitrochlear and cervical glands are similarly affected. The enlargement and tenderness are seldom great. In patients with a primary ulcer the lymphatic glands draining the site may be greatly enlarged and extremely tender; but often these glands are no bigger than the glands elsewhere. In the "intermediate" human case described above, the progressive involvement of the groups of glands could be followed until all were affected. It is probable that, when the initial lesion has been inconspicuous and fleeting, the same progressive involvement has taken place but has been proportionately inconspicuous and fleeting, so that when the patient comes under medical care no one group of glands predominates.

Fever.—In most of the uncomplicated cases of our series the fever showed the same main features. During the first few days the temperature is about 102° F.; from the seventh to the twelfth day it is at its maximum, reaching 104–105° F.; it then declines by quick lysis to normal or 99° F. by the thirteenth or fourteenth day. A brief rise to 100–101° F. during the next day, falling to normal within twenty-four hours, and often repeated on the following day, marks the end of defervescence. The average duration of fever is thus fourteen to fifteen days. Daily remissions are the rule; they range from one to three degrees Fahrenheit and take place usually in the morning.

There are many variations from this typical curve. The temperature may be very high from the outset. Daily remissions may be either inconsiderable or pronounced; in one instance the temperature fell on the fourth day from 104° F. at 4 A.M. to 98·6° F. at 8 A.M., rising to 101·6° F. twelve hours later. In a few cases complete defervescence took place during twenty-four hours. In others the fever lasted only twelve or thirteen days. A complicating acute bronchitis or bronchopneumonia prolongs the febrile period considerably; in one patient this lasted twenty-three days; in another, twenty-seven days; in another, after a typical defervescence that ended on the fifteenth day, a rise of temperature to 103° F. on the sixteenth day marked the onset of bronchitis, with fever of seven days' duration.

Severity cannot be gauged by the height of the fever. In the graver cases the rise of temperature may be relatively slight, especially in delirious or stuporose patients, a feature noted by Wolbach and his colleagues (1922) in western (louse-borne) typhus. In two such cases in our series which ended

fatally the average temperature during the last four or five days was about 99·6° F. In some of the fatal cases there was a terminal hyperpyrexia ; in others, a terminal fall to subnormal.

Pulse-rate is always increased. Usually it is 100–120, but wide variations are found. It may not strictly follow the fluctuation of temperature, though in defervescence it usually declines with it. In one stuporose patient the pulse-rate never exceeded 96 until the day of death ; in patients with cardiac failure, on the other hand, the rate may exceed 150. Bradycardia was present in one or two cases during the first few days of convalescence. Where there is acute bronchitis or severe delirium the pulse may become irregular.

Respiration is slightly accelerated in the milder cases, but in the presence of much pulmonary congestion, acute bronchitis, or delirium the rate exceeds 40.

Headache was present in 92 per cent. of cases ; it is most severe during the first week, and passes off as fever declines. Vomiting occurred in 39 per cent. of cases at the onset, rarely persisting beyond the first few days. Epistaxis was noted in only 4 patients. Catarrh, present in 28 per cent. of cases, is always mild.

Cough was present in 80 per cent. of the series, causing anything from mere discomfort to great distress ; expectoration is rare in the absence of complications. The commonest lung affection was a mild congestion. Râles and rhonchi, present in 64 per cent. of the patients, were usually few and basal ; but in 13 per cent. of these an acute bronchitis or bronchopneumonia supervened with consequent dyspnœa, cardiac embarrassment, prolongation of illness, and graver prognosis.

Rash.—It was rarely possible to make out a rash in the dark-skinned Tamils, who constituted the majority of our patients. In a few one could observe an indefinite subcuticular mottling on close scrutiny of the chest and abdomen. In most of the Sikhs, however, and in all the Europeans the rash was visible. A prodromal rash was noted by Fletcher and Field (1927) ; in one of their cases it was urticarial, affecting the face, and disappeared within twenty-four hours. None of our patients was seen on the first day, and only one on the second day. The rash proper appears between the fourth and sixth day. Its distribution is general, on the chest, abdomen and flanks, limbs, and in some cases the face. Both macules and papules are present, discrete and dusky-red, and fading on pressure ; they never become confluent. They are about 1–1·5 cm. in diameter. The papules are just perceptibly raised. In one European one could clearly distinguish an intense red centre which shaded off gradually to a less intense periphery. Macules on the face are larger and darker than those on the trunk. Fading begins as a rule on the third day of the eruption and is complete within six or seven days.

In a case described by Fletcher and Field (1927) there was a macular rash on the chest and abdomen when the patient was first seen on the seventh day ; the macules soon disappeared, but rose spots appeared on the abdomen, lower part of the chest, and front of the arms, suggesting typhoid. In another patient macules were present on the palms and soles. In others some of the macules became purpuric, and in one case they could be detected as a dusky mottling of the abdomen as late as the thirty-third day.

The striking resemblance of the rash to the macular rash of secondary syphilis has been emphasised by Fletcher and Field (1927).

Spleen.—Most of the patients had probably had malaria ; therefore the splenic enlargement noted in 80 per cent. cannot certainly be attributed to tsutsugamushi ; moreover, it was present in only 1 of 15 Europeans. But that it may be due to tsutsugamushi is suggested by the many instances of appreciable shrinkage of the spleen during convalescence. Tenderness on palpation of the spleen was present in a few cases.

Deafness.—Some deafness was present early in 66 per cent. of patients. In 50 per cent. it was slight, in 8 per cent. considerable, and in 8 per cent. extreme. The waxing and waning of this symptom in the extreme cases is striking. One such patient, whose illness was protracted by an acute bronchitis, was only slightly deaf when seen on the ninth day, and his history was easily elicited. When seen again on the sixteenth and eighteenth days he was stone-deaf ; but his hearing had partially returned on the twentieth day, and was again normal on the twenty-seventh.

Eye signs.—The commonest affection of the eyes—present in 40 per cent. of our cases—is a peculiar mild suffusion, with photophobia. The eyes are half-closed, somewhat watery and faintly glistening, and give a dulled yet anxious expression to the countenance. Injection is present but usually slight. In the darker-skinned Asiatics the eye condition is a valuable aid to the early diagnosis of mild cases ; for in these, apart from raised temperature and pulse-rate, there may be only slight cough and chest pain, slight deafness and headache, and slight enlargement of the glands of the groin. Injection of the conjunctival vessels may be noticeable, but only rarely.

Nervous system.—Mental disturbance was present in 35 per cent. of the cases. In the majority it is manifested as delirium, sometimes as stupor of varying degree. The delirium, only slight during the first few days of illness, increases during the second week and subsides with defervescence. It is mainly of an active type, exaggerated at night, and occasionally evident only then ; the patient attempts repeatedly to get out of bed, and is liable to wander from hospital unless watched. In some cases there is a low muttering delirium ; the patient takes little interest in his surroundings, and though at times he can answer rationally his cerebration is slow. There are tremors of the lips and tongue and twitchings of the face and fingers. Stupor may vary from a mere dulling of the intellect to absolute coma. In the slighter degrees the patient's expression is dull and vacant ; his clouded intellect can only imperfectly appreciate questions. The condition is short-lived, appearing late in the fever.

Occasionally, especially where insomnia, headache, and congestion of the lungs have induced great prostration, the patient is irritable towards his condition, the nursing staff, and treatment, and complains bitterly and repeatedly. Slight giddiness is common, often accompanied by headache, and it may be troublesome in those with much pulmonary congestion and consequent bouts of coughing.

Pain is rarely pronounced. In 40 per cent. of patients there was pain across the chest, made worse by coughing and undoubtedly due to congestion of the lungs. A vague aching, described as being all over the body, was present in 2 per cent. of cases. Other less common sites of pain are, in order of frequency, joints, lumbar region, glands of groin, back of neck, and throat. In 8 cases there was abdominal discomfort with associated distension.

Pain localised to the hepatic and splenic areas was present in 4 and 3 patients respectively, in all of whom pulmonary congestion was severe.

A leaden hue of the face and neck was conspicuous in 2 of the European patients. Œdema of the feet was rare. Sore-throat and hoarseness were often present in the later stages. Aphonia was rare, except as a terminal event. The tongue was furred in 82 per cent. of cases. Looseness of the bowels was present in 34 per cent., but in only 12 per cent. could it be termed diarrhœa. Retention of urine occurred in only 1 patient; supervening on the ninth day of illness it continued until death on the seventeenth. Incontinence of bladder and rectal sphincters was rare. Appearing late in the disease it is a grave sign; only 1 patient thus affected recovered. Albumin could be demonstrated in the urine of about half the patients. It is never more than a trace and is transient.

COMPLICATIONS

The commonest complication, developing in 13 per cent. of our series, was an acute bronchitis or bronchopneumonia, most often supervening during the second week, rarely after defervescence. In 2 cases venous thrombosis and its local sequelæ developed, and 1 patient had bilateral parotitis and left facial paralysis. A subdural hæmorrhage with resulting hemiplegia was noted once. It took place on the thirteenth day and was the immediate cause of death in a patient comatose from the ninth day onwards.

COURSE OF THE DISEASE

During the first five or six days the disease is usually mild. Apart from fever and headache, the syndrome is characterised by sudden onset, deafness, cough, pain in the chest, suffusion of the eyes, occasional vomiting, and slight enlargement of lymphatic glands; not all of these may be evident. In dark-skinned patients the rash rarely affords help. At this time there is little to indicate whether the infection will prove mild or severe, except in the few cases with early delirium.

As the second week progresses the signs increase, especially deafness, pulmonary congestion, and mental disturbance; and there is some degree of prostration. Should delirium or a lung complication develop a severe infection is certain and the outcome is always in doubt. In 50–60 per cent. of cases, however, neither occurs, and decline of fever brings rapid improvement. Headache, cough, pain and discomfort are lost, the appetite returns, and restlessness gives place to repose; although prostration and occasionally deafness may linger, the patient is fit for discharge from hospital within a further seven or eight days. In a minority of cases toxæmia is more intense and the pulse becomes irregular; delirium or lung complications, often both, dominate the picture. Insomnia, discomfort, and cardiac and respiratory embarrassment induce great prostration, and the condition of the patient is critical. Yet recovery, remarkable in its rapidity, often follows; and, as in the less severe cases, convalescence is uneventful, save for protracted physical exhaustion. Death is usually due to intense toxæmia and myocardial failure; less often to bronchopneumonia. An acute bronchitis or bronchopneumonia prolongs the course of the disease; otherwise the regularity of the evolution of tsutsugamushi, in sequence of clinical events and duration, is most characteristic.

CASE-MORTALITY

Of the 181 patients under our close observation, 13 died. One of the striking features of tsutsugamushi in Malaya has been the increase in the case-mortality in recent years; in one endemic area, in 1929 it was treble that of 1927. The case-mortality is now about 15 per cent. This rate, though much below that of the more severe epidemics of the louse-borne typhus of Europe, is about equal to the European rate in interepidemic periods and in some of the less severe epidemics. Whether, as in louse-borne typhus, the mortality is higher in the old than in the young is difficult to decide. The incidence is closely bound up with occupation. More than 200 of this series were Tamil labourers, all but 3 or 4 of whom worked on estates; and it is rare for the Tamil labourer to remain in Malaya, and still more so to work on an estate, beyond the age of fifty. Further, the labourer's estimate of his age can rarely be accepted as accurate. About 25 patients were under eighteen; 2 of these died—a girl of eleven and a boy of fifteen. About 20 patients were over forty, and 4 of these died.

WEIL-FELIX REACTION

The serum of patients convalescent from tsutsugamushi agglutinates the OXK type of proteus strains but not the OX 19 type. In our series repeated samples were drawn and tested during convalescence, as urged by Fletcher and Lesslar (1926), and evidence was thereby obtained of a waxing and waning titre, which constitutes almost certain proof of an active infection. The serological reactions of the first few patients in Malaya with a primary ulcer suggested that their sera agglutinated the OXK type to low titres only. Felix and Rhodes (1931), however, using sera from Japan and Sumatra from patients with a skin lesion, showed that agglutination was constant and often high. We have amply confirmed this finding among our cases in Malaya, readings higher than in 1 in 2000 being common. It may happen, though extremely rarely, that the clinical picture is typical of tsutsugamushi, yet the Weil-Felix reaction is persistently negative. In our series only 2 cases were in this category. It is occasionally asked what is the lowest titre that may be regarded as positive evidence of tsutsugamushi infection. In our experience an arbitrary standard of agglutination in a serum dilution of 1 in 125 may be taken as the lowest limit; but such low titres should be regarded as establishing the diagnosis only when the syndrome of tsutsugamushi is present, since in 2 of 11 cases of leptospirosis (see below) titres of 1 in 480 were recorded. Where successive samples of sera are available, the presence or absence of a waxing and waning agglutination curve simplifies interpretation.

DIFFERENTIAL DIAGNOSIS

Three diseases may in their early stages afford difficulty in diagnosis: urban typhus (shop typhus), leptospirosis, and typhoid fever.

Urban typhus simulates clinically those cases of tsutsugamushi that have no skin lesion when seen by the physician. The disease is conveyed by the rat flea, *Xenopsylla cheopis*; a skin lesion is never visible. Sera from convalescent patients agglutinate only the OX 19 type of proteus strains. In contrast to tsutsugamushi, it is a disease of the town, especially of the small and congested food shops that abound in every eastern town and village. If blood is drawn early in the fever and inoculated intraperitoneally into male guineapigs, these will usually develop fever and scrotal swelling; whereas guineapigs are very insusceptible to inoculation of blood from patients with tsutsugamushi, and the few that react do not, in our experience, develop scrotal swellings.

Leptospirosis.—In even moderately severe cases extreme tenderness of the calf muscles and a much greater injection of the eyes than that seen in tsutsugamushi are valuable diagnostic points from the outset. In milder cases, in which muscular pain may be barely appreciable, early differentiation is not easy. The characteristic red or reddish-brown spots, small and closely set, contrast with the larger and more discrete papules and macules of tsutsugamushi. In many cases the rash is absent. The fall of temperature early in the second week, the negative Weil-Felix reaction (in all but rare instances), and the ready experimental reproduction of the disease in guinea-pigs make later diagnosis easy.

Typhoid presents in the early stages two distinguishing features: its insidious onset and its less rapid development. The patient's condition in tsutsugamushi at the beginning of the second week is comparable with that of the third week in typhoid. At the end of the second week the rapid defervescence (in cases uncomplicated by bronchitis) and the rising titres of the Weil-Felix reaction are conclusive of tsutsugamushi.

RECURRENT TRAUMATIC HERPES

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Since the work of Löwenstein (1919), confirming the then unpublished observations of Grüter (1924) and Kraupa (1920), it has been recognised that herpes simplex is due to a filtrable virus. Several points in the œcology of the disease, however, still remain obscure, more especially as regards the mechanism of relapse.

The experimental isolation of the virus from epidemics of stomatitis in children by Dodd, Johnston, and Buddingh (1938) in America, and by Burnet and Lush (1939) in Australia, has shown that in the poor classes, at any rate, infection is caught in the first years of life. Confirmation is thus forthcoming of the views expressed by Holt (1908), who believed that epidemic stomatitis of infants was the same infection as that causing herpes of the face and lips, the differences in appearance being solely due to location. When once infection has been acquired, the virus appears to remain latent in the tissues, the presence of the virus being correlated with the continued existence of immune bodies in the serum. Despite virucidal immune bodies in the blood repeated attacks of herpes may develop, but the reasons why non-specific factors, such as colds in the head, pneumonia, cerebrospinal meningitis, menstruation, injections of heterologous serum, and administration of certain drugs, should precipitate attacks are at present unknown, while the exact situation in which the virus remains latent is also a matter of speculation.

RECURRENT TRAUMATIC HERPES

These problems are brought into prominence by the occurrence of what has been termed recurrent traumatic herpes. Only four such cases have previously been reported, all of them in France, and of these one was the result of an experimental inoculation.

The first case (Nicolau and Poincloux 1924) was that of a Parisian hairdresser who, as a result of constantly using curling-tongs, set up a chronic irritation on the external border of the second phalanx of the index finger of her right hand. In October, 1918, unassociated with any previous attack of neuralgia there appeared a typical herpetic eruption on the irritated area of skin. In May, 1919, the eruption again broke out on the same area of skin, and similar attacks developed in March, 1920, in February and April, 1921, and in April, 1922. Six attacks, all except the first in the spring months, thus occurred in five years. The recurrent attacks were preceded by pains in the radial nerve of the right arm and on one occasion by symptoms suggesting a meningo-encephalitis.

Herpes virus was isolated from the characteristic herpetic vesicles during the attacks, but virus could not be obtained from the area of skin involved 28 and 48 days after the eruption had ceased. The virus was also absent from the cerebrospinal fluid 20 days after the beginning of an attack. On the other hand, on fourteen out of sixteen occasions, spread over two years, herpes virus was isolated from the patient's saliva.

Eventually the rectangle of skin affected by the lesions was removed, and a portion of skin from the thigh was grafted on to the affected area. In the following spring the patient again experienced neuralgic pains in the radial nerve of the right arm, but no herpetic eruption appeared then or since (Nicolau and Poincloux 1928).

The second case (Nicolau and Poincloux 1925) was that of a dressmaker who had two attacks of herpes on the middle finger of the left hand in October and December, 1924. The skin on this finger was often irritated by pricks from her needle, and from the age of 5 she had suffered from attacks of urticaria on the left hand whenever she ate strawberries. At one time she had recurrent labial herpes, but for eleven years before October, 1924, she had had no eruption on her lips. She had a recurrence of the labial herpes however 5 days before the second attack in December, 1924. In this instance also the herpes virus was isolated from the lesions on the finger.

The third case (Gougerot and Blum 1934) concerns an amateur fisherman who, while unhooking a rainbow perch which he had landed, pricked the skin of his right middle finger with the dorsal fin of the fish. This accident happened in September, 1932. Within a few days the finger became swollen, and a large vesicle appeared at the site of the injury. The vesicle and the swelling gradually disappeared, but for the next two years, sometimes once a month, sometimes every two months, a large bullous swelling appeared on the same area of skin. Small separate vesicles were never seen. Herpes virus, however, was isolated from the serous contents of the giant vesicle.

The fourth case (Paulian 1932) differs from the others in that the original infection was due to an experimental inoculation with herpes virus. A medical man experimentally inoculated himself with herpes virus in the spring of 1923 on the skin of the left arm. An extensive eruption appeared and was followed by recurrent attacks at the point of inoculation in 1924, 1925, 1926, and 1927. All the attacks were associated with neuralgic pains in the inoculated as well as in the opposite arm. In 1928 there were several attacks, again associated with neuralgic pains. In 1929 he developed a meningo-encephalitic syndrome associated with weakness, photophobia, headache, vomiting, and a temperature of 104° F., which lasted ten days. Later there appeared paralysis of the right arm, spasmodic contracture, *main en griffe*, paralysis of the thenar, hypothenar, and interroseous muscles of the right hand, exaggeration of the deep reflexes, nasal voice with scanning speech, difficulty in swallowing, and atrophy of the tongue. Early in 1930 similar changes took place in the left arm. During

this time—in February, 1930—herpetic lesions appeared on the skin of the right arm. The patient eventually died in November, 1930, with lesions similar to those associated with amyotrophic lateral sclerosis.

CLINICAL HISTORY

The patient whose history is here recorded was born on August 12, 1933, the first child of well-to-do parents. Beyond a slightly premature birth there is nothing exceptional in her early history. She was duly vaccinated and immunised against diphtheria; when 20 months old she fell from her perambulator, cutting her lower lip and leaving a small scar. In January, 1935, she had a cold with slight bronchitis. Later, when on holiday at the seaside in June, 1935, she fell down and grazed the palmar surface of her right hand. Before this she had never had anything remotely resembling an herpetic eruption either on the lips or in the mouth. After the injury to her hand there was some swelling at the base of the index finger, extending on to the palmar surface of the right hand, and 11 days after the accident small vesicles appeared on the same area. These later faded away, but at intervals of two to three or sometimes six months, a similar vesicular eruption has reappeared. The blisters have developed either at the base of the right forefinger or about 1 cm. away on the palmar surface of the hand. The first appearance is of slightly tender red spots which quickly become vesicular and then pustular. Sometimes instead of, or besides, the small vesicles, one large blister develops. The regional lymph nodes are not enlarged. During 1938 attacks were more frequent, coming on at intervals of two to three months; from December, 1938, however, there was no further attack till September, 1939. No neuralgic pains precede the eruptions on the hand. Although there had never been any outbreak of herpes on the lips or mouth before the lesions on the hand, since 1935 the child has had four attacks of labial herpes. The eruption is, however, always confined to the area of the scar resulting from the fall at the age of 20 months. The outbreaks of labial herpes do not correspond to, and appear to bear no particular time relation to, the eruptions on the hand.

EXPERIMENTAL OBSERVATIONS

Fluid removed from the vesicles on the hand with sterile capillary tubes, when rubbed on the scarified cornea of the rabbit, produced cloudiness after 24 hours and a definite opacity with conjunctivitis after 48 hours. Nine out of ten rabbits whose corneæ were thus scarified subsequently developed symptoms of encephalitis. The cells of the corneas and those of the rabbits' brains contained acidophilic intranuclear inclusions. The virus also regularly produced a fatal encephalitis in mice 48 hours after intracerebral injection; after intranasal instillation 60 per cent of mice died, and after intraperitoneal injection 20 per cent. The virus, unlike those isolated from the other cases of recurrent traumatic herpes, is thus highly encephalitogenic. Tests made for the presence of immune bodies in the child's serum showed that a 10 per cent. suspension of infected mouse brain, mixed with an equal amount of the serum, was rendered non-infective when injected intracerebrally into mice. An anti-herpetic rabbit serum, for which our thanks are due to Prof. S. P. Bedson, F.R.S., also neutralised the virus. Efforts to demonstrate virus in skin scrapings from the affected area on the hand in the interval between attacks were on two occasions unsuccessful, thus agreeing with the results described by Nicolau and Poincloux (1924).

Both parents of the child occasionally had labial herpes, although neither had an eruption at the time of or immediately before the child's first attack. Attempts to isolate herpes virus from the saliva of the parents failed on two occasions, and the patient's saliva also gave a negative result when examined between attacks.

DISCUSSION

The clinical and experimental evidence shows that a recurrent herpes may be caused by a primary implantation of virus into the skin. In the three adult cases of recurrent traumatic herpes previously recorded the wound was probably infected with herpes virus from the patient's saliva; in the second case, for instance (Nicolau and Poincloux 1925), the reappearance of the vesicles on the hand was immediately preceded by a labial herpes. The source of infection in the case here recorded is more obscure, and the fact that before her fall she had never had any buccal or labial eruption suggests that an autogenous infection is extremely unlikely. Possibly, however, the wound became accidentally infected by the saliva of one of the parents.

In epidemic form herpetic stomatitis presumably spreads as a droplet infection. Herpes differs from almost all other virus infections, unless perhaps the common cold, in that despite the presence of immune bodies in the serum it often relapses, and, as in the case here described, the same areas of skin are repeatedly affected. The most probable explanation of the recurrences is that, after an eruption has appeared, there is a local accumulation of immune bodies in the area affected. With the passage of time the concentration of immune bodies is reduced, and the epidermal cells are then in a condition to be reinfected. A similar explanation has been advanced by Perdrau (1938) for herpetic encephalitis in rabbits immunised six months previously with living herpes virus.

The fact that recurrences develop and are apparently unassociated with fresh infections from outside presupposes that the virus must remain in the tissues in an inactive condition during the intervals between the attacks. The question is thus raised as to the tissues in which the herpes virus remains latent. Three possible sites are suggested: the epidermal cells, the ganglion cells of the nerve-roots, and the terminal nerve-endings. The failure by Nicolau and Poincloux (1924) and ourselves to isolate herpes virus from the epidermal cells of the affected areas in the intervals between eruptions does not support the suggestion that these cells harbour the virus. Experiments with skin grafts made by Stalder and Zurukzoglu (1936) confirm this view: portions of skin which had been the site of an herpetic eruption were grafted on to another part of the body and, after complete healing had taken place, an injection of Pyrifer was given to stimulate the appearance of herpes. An herpetic eruption duly broke out on the undisturbed skin where herpes had previously appeared but not on the skin grafted on to a new site.

The same experiments of Stalder and Zurukzoglu, which were carried out on two patients, may also be used to oppose the view that the herpes virus lies latent in the terminal nerve-endings, because it is difficult to cut so-called epidermal grafts of such uniform thickness as totally to avoid the inclusion of nerve-terminals. Since, however, such nerve terminals are severed from their nerve-fibres, they must undergo rapid degeneration, and the herpes virus might conceivably be quickly destroyed.

The view that herpes virus remains latent in the cells of the spinal ganglion corresponding to the area of skin involved has much to commend it, for it is

now known from experiments on rabbits that, even when a non-encephalitogenic strain of herpes virus is placed on the scarified cornea, it will travel to the brain. Besides, in two of the recorded cases of traumatic herpes symptoms of meningo-encephalitis have been noted, showing that herpes virus had passed centripetally from the skin to the central nervous system. Zurukzoglu (1937), in collecting the results of various observers, has pointed out that herpes virus has been isolated from the cerebrospinal fluid of 21 out of 280 persons examined, thus also suggesting centripetal migration of the virus. Direct proof of the continued presence of herpes virus in nerve ganglia and its periodic centrifugal migration is, however, lacking. Burnet and Lush (1939) examined gasserian ganglia removed post mortem from six persons who had no labial herpes at the time of their death, but they failed to isolate the virus from any of them. Some years ago Howard (1905) examined gasserian ganglia of patients dying from pneumonia and cerebrospinal meningitis associated with unilateral facial herpes. On the affected side degenerative changes were found in the nerve-cells, the ganglia being infiltrated with leucocytes. As evidence for the presence of the virus in the spinal ganglion cells, Nicolau and Poincloux (1928) cite the cure of their first case of recurrent traumatic herpes by removal of the skin from the area affected by the recurrences and its replacement by healthy skin from the thigh. They say that no recurrence took place in the newly grafted skin, but they do not give any details of the return of sensation in the graft. As a rule, the return of sensation in skin grafts is rapid in thin but slower in thicker grafts, the time being 3 to 12 months. Although epicritic sensation almost always remains absent, heat and cold eventually return, as does protopathic sensation. If herpes virus remains only in the cells of the ganglion, and the fibres from these cells eventually reenervate the newly grafted skin, it is surprising that a permanent cure of the recurrent herpes should result. It is obvious that further investigations are necessary before conclusive evidence can be obtained as to the cells in which the herpes virus remains latent.

SUMMARY

A case of recurrent traumatic herpes in a child is described. Only four analogous cases have previously been reported. The mechanism of recurrence and latency of the herpes virus is discussed.

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DOSAGE OF SULPHANILAMIDE DERIVATIVES FOR CHILDREN

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It is agreed that sulphonamide therapy gives the best results when the concentration of the drug in the blood is 4–10 mg. per 100 c.cm. It is therefore important to know what dosage will produce this concentration. This question has been investigated in children, of whom 64 received M. & B. 693, 13 sulphanilamide, and 4 Proseptasine. Most of the children were given M. & B. 693 prophylactically after tonsillectomy ; the others had a variety of diseases. The concentration of the drug in the blood was estimated twenty-four or more hours from the beginning of the course, by which time it is maximal. After the first day of administration the concentration does not vary from hour to hour even though the drug is given only six-hourly (Wilson et al. 1939).

ESTIMATION

The drug was diazotised and linked with diphenylamine (Doble and Geiger 1938). This linkage produces a strong yellow with small concentrations of the drug, but a "blank" is colourless. The intensity of the colour is nearly proportional to the concentration between 0 and 20 mg. per 100 c.cm. ; hence a large number of standards is not necessary.

Technique.—To one volume of oxalated blood two volumes of an aqueous solution of saponin[1] 0·05 g. per cent. are added, and then two volumes of a 20 per cent. aqueous solution of *p*-toluenesulphonic acid,[2] drop by drop, with shaking. The mixture is allowed to stand for 10 min., and is then centrifuged and filtered. To 2 c.cm. of the filtrate 0·05 c.cm. of a freshly prepared 1 per cent. aqueous solution of sodium nitrite is added, the mixture is allowed to stand for 3 min., and then 2 c.cm. of a 0·2 per cent. solution of diphenylamine in absolute alcohol is added. Standards are set up equivalent to 5 and 10 mg. per 100 c.cm. at the same time. The colour develops rapidly for the first 20–30 min. ; hence the standard and the unknown should be compared in the colorimeter after about 40 min.

By this technique only the free drug is estimated. Besides the free drug there is an acetylated fraction in the blood. This fraction is hydrolysed when the

SCHEME FOR DOSAGE OF SULPHANILAMIDE DERIVATIVES IN CHILDREN

Age	Dose (0·5 g. tab.)	Dose in 24 hours (g.)	Age	Dose (0·5 g. tab.)	Dose in 24 hours (g.)
0– 3 mths.	½ 4-hourly	0·75	4– 8 years	1 4-hourly	3·0
3– 6 ,,	½ 6- ,,	1·0	8–12 ,,	2 6- ,,	4·0
6–18 ,,	½ 4- ,,	1·5	Adult	2 4- ,,	6·0
1½–4 years	1 6- ,,	2·0			

The initial dose should be twice as big as the subsequent doses shown.

1. Distilled water may be substituted for the saponin solution, but then hæmolysis is complete only at the end of half an hour. If hæmolysis is incomplete, the result is too low.
2. Trichloracetic acid may be used instead of *p*-toluenesulphonic acid, but then some of the acid is decomposed in the water bath. The consequent rise in the pH makes the colour very different from that of an unheated standard. The pH can be lowered again by adding a few drops of concentrated hydrochloric acid, but the result is not very accurate.

acid filtrate obtained by the above-mentioned technique is heated in the boiling water bath for 40 min. After it has cooled, sodium nitrite and diphenylamine are added as before, thus estimating the total (free + acetylated) sulphanilamide in the blood. With this technique the recovery of sulphanilamide added to blood is 100 per cent.

RESULTS

In children receiving M. & B. 693 the free drug in the blood was usually 80–90 per cent. of the total, but lower figures down to 60 per cent. were occasionally recorded. The mean was 85 per cent. The proportion of the drug in the free state did not fall appreciably during the first three days of administration. There was a rough correlation between the dose of the M. & B. 693, the concentration in the blood, and the weight or age of the patient (figs. 1 and 2).

The results suggest that the therapeutic concentration of the free drug of over 4 mg. per 100 c.cm. will as a rule be attained if the dosage follows the scheme shown in the accompanying table, which differs only slightly from that of Evans and Gaisford (1938). Wilson et al. (1939) suggested a similar dosage of gr. 1–1½ per lb. of body-weight after estimating the concentration of M. & B. 693 (sulphapyridine) in the blood of 35 children receiving the drug for pneumonia. It is important that an effective concentration in the blood should be reached as quickly as possible; hence the initial dose should always be twice as great as subsequent doses.

The recommended dose will give widely different concentrations in the blood in different children of the same age and weight. So insoluble a drug naturally shows great variation in absorption; the rate of its excretion depends on the output of urine; if there is much vomiting, the amount of absorption becomes even more uncertain. The sulphanilamide derivatives, therefore, can be used to the greatest advantage only if the dose is controlled by estimating their concentration in the blood.

The results obtained with sulphanilamide and proseptasine suggest that a similar scheme of dosage would be suitable with these drugs; but the cases were too few to draw definite conclusions.

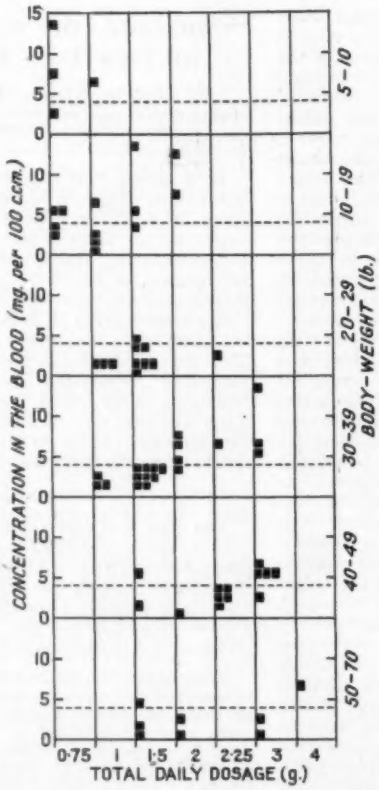

FIG. 1—Concentration of free M. & B. 693 in the blood according to dose and body-weight. Each black square represents one case.

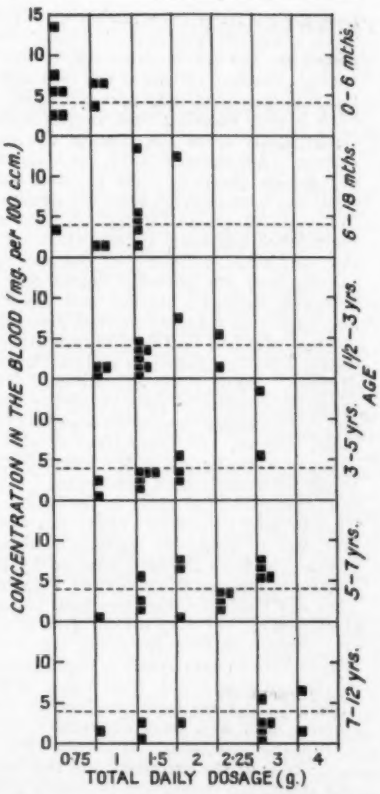

FIG. 2—Concentration of free M. & B. 693 in the blood according to dose and age.

SUMMARY

(1) A method is described of estimating the concentration of sulphanilamide and its derivatives in the blood.

(2) Such estimations were made on 81 children, and the results are correlated with dose, age, and weight.

(3) A table is given suggesting the dosage at various ages.

(4) For the best results, the dosage must nevertheless be controlled by estimations of the concentration of the drug in the blood.

My thanks are due to Dr. W. W. Payne for much helpful advice, and to the honorary staff of the Hospital for Sick Children for permission to make these investigations on their cases.

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SOME MEDICAL ANTIQUES.—We have received from E. P. Goldschmidt and Co., Ltd., of 45, Old Bond Street, W.1, a catalogue of old medical and other instruments, including an anatomical model in ivory of the ear about 200 years old; lancets from Roman, Arabian, and later times; a homœopathic medicine chest about 100 years old, shaped like a book and containing 112 tiny glass bottles all corked and mostly with their drugs inside; and some early eighteenth-century microscopes.

TUBERCULOSIS IN MEDICAL STUDENTS

DIAGNOSTIC SERVICE AT UNIVERSITY COLLEGE HOSPITAL MEDICAL SCHOOL

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(WITH ILLUSTRATIVE PLATES)

ABOUT a third of the total deaths from disease among young adults are due to pulmonary tuberculosis, and this age-group has shared least in the general decline in mortality from tuberculosis in the present century. In 1935 the committee of University College Hospital medical school introduced a scheme for the periodic medical examination of students occupied in clinical training or in junior qualified appointments at the hospital, to reduce by early detection the morbidity from pulmonary tuberculosis. This scheme began in February, 1936, and a preliminary report has already been given (Hart 1937). It has now been in operation for more than three years, and the administrative routine and the results up to June, 1939, are here presented so that the practicability and value of such a service in this country may be judged.

POPULATION AT RISK

The present service excludes preclinical students. It covers unqualified students from the beginning of their clinical course at University College Hospital and those who, after qualification, are holding resident or other junior staff appointments or are studying at the hospital for further examinations. Qualified students cease to be covered by the scheme as soon as they leave the hospital.

The average annual entry to the clinical course at this school in recent years has been about 70 students, of whom 12 have been women. If three years is taken as the average time for qualification, the unqualified student population at risk at any moment is about 200, to which figure must be added those holding junior qualified appointments (about 30), plus postgraduate students, making about 250 in all. This was, in fact, the approximate number of men and women examined during the first few months of the scheme, and the addition of new students up to date has brought the total examined up to 417, composed of 349 men and 68 women. It may be noted that 290 of the men and 58 of the women were aged nineteen to twenty-five at the time of their first examinations, the small remainder being older than twenty-five.

The scheme is not compulsory, but more than 98 per cent. of those eligible to join it during the period under review have done so. There is no reason to suppose that the omitted 1–2 per cent. were a selected group from the point of view of their tuberculosis incidence.

It is obvious that the individual students in the present series have been observed for different lengths of time, for many senior students naturally dropped out of the scheme soon after its start, and most of the very recent entries have been examined only once. This variability is shown in table I, where the students are classified according both to their seniorities at first examination under the scheme and to their total periods of observation in the scheme. Only a minority of the population at risk (78 men and 16 women students) were under observation for the whole three years under review. Because of the differing individual periods of observation it is more useful to base the incidence of lesions upon student-years of observation rather than merely upon total number of students (see table II). The total person-years of observation are 525 for the men and 100 for the women.

ADMINISTRATIVE ROUTINE

All information obtained is treated as confidential, and any student thought to have a progressive lesion is referred for advice to the doctor of his choice. The cost of the service is defrayed by the medical school, but not the cost of treatment.

An explanatory leaflet is issued to each student before his first medical examination. The student is examined by screening and radiography. At the same time he answers a questionnaire concerning family history and past and present medical history from the point of view of disease of the respiratory tract. Discussion between the radiologist and the physician is followed by an interview between the physician and the student, at which the history is completed and the weight is recorded, but no physical examination is made unless the history or the radiograms have revealed some abnormality. If there is any indication, the sputum and sedimentation-rate are examined. (Mantoux tests have not been carried out until latterly—see below.) The student is informed by the physician of the result of the examination, and any special action, such as restricted life or sanatorium, and the date for the next routine examination are decided on.

TABLE I—CLASSIFICATION OF STUDENTS ACCORDING TO SENIORITY AT FIRST EXAMINATION AND ACCORDING TO TOTAL PERIOD OF OBSERVATION

Years between entry to clinical course and first examination	Years under observation				
	3·4–2·5	2·4–1·5	1·4–0·5	0·4–0·0	Total
MALES					
0–0·4	57	40	48	38	183
0·5–1·4	12	38	35	3	83
1·5–	9	15	41	18	83
Total	78	88	124	59	349
FEMALES					
0–0·4	5	7	9	8	29
0·5–1·4	6	7	8	0	21
1·5–	5	0	10	3	18
Total	16	14	27	11	68

The interval between the first and the most recent examinations under the scheme is taken as the period of observation. Those who received only a single examination are placed in the category 0·4–0·0 years under observation.

The standard interval between routine examinations is a year. This is shortened if closer observation is indicated by a tuberculous family history, special contact risk, a negative Mantoux test (see below), or any radiological abnormality in the chest. A history of recent pleurisy or of spontaneous pneumothorax also suggests the need for special attention. Further, the student is encouraged to report before his next routine examination is due if any relevant symptoms develop, such as general unfitness, loss of weight, persistent cough, or pain in the chest.

Re-examinations are similar to the first examination, though screening is usually omitted. The chest film is taken under conditions so far as possible comparable with those used on the first occasion. At the clinical interview the weight record and medical history are brought up to date.

During the second half of the period under review many of the new students beginning their clinical course at University College Hospital and so becoming eligible for the present scheme had already, during

TABLE II—CLASSIFICATION AND INCIDENCE OF MORE IMPORTANT TUBERCULOUS CHANGES FOUND AMONG STUDENTS

		MALES				FEMALES			
	Tuberculosis category	Number of cases	Case-incidence per 100 students observed	Case-rate per 100 student-years of observation	Advice given	Number of cases	Case-incidence per 100 students observed	Case-rate per 100 student-years of observation	Advice given
	(i)	(ii)	(iii)	(iv)	(v)	(ii)	(iii)	(iv)	(v)
A	Pulmonary fluffy shadows ..	9 (5)	2·6	1·7	San. 4(2) R.L. 1(1) N.L. 4(2)	4 (2)	5·9	4·0	San. 1(0) R.L. 1(1) N.L. 2(1)
B	Pulmonary "coin" shadows	3 (3)	0·9	0·6	N.L. 3(3)	1 (1)	1·5	1·0	N.L. 1(1)
C	Pleurisy	5 (2)	1·4	1·0	San. 1(1) R.L. 2(1) N.L. 2(0)	0	0	0	—
D	Gross apparently healed pulmonary lesions	2 (0)	0·6	0·4	N.L. 2(0)	0	0	0	—
E	Non-pulmonary	2 (1)	0·6	0·4	San. 2(1)	0	0	0	—
A–E	Total tuberculous changes .	21 (11)	6·1	4·1	San. 7(4) R.L. 3(2) N.L. 11(5)	5 (3)	7·4	5·0	San. 1(0) R.L. 1(1) N.L. 3(2)
F	No definite important tuberculous changes	328 (338)	94·0	62·5	—	63 (65)	92·6	63·0	—
A–F	Total students observed ..	349 (349)	100	—	—	68 (68)	100	—	—
	Total student-years of observation	525	—	—	—	100	—	—	—

EXPLANATORY NOTES

Col.

(i) The classification into categories is based upon the "maximal" condition of each student during the period of observation, fluffy shadows being given for this purpose precedence over the other types of change. For example, whereas a student with pleurisy alone would be placed in category C, he would be placed in category A if the pleurisy were succeeded by fluffy shadows.

(ii) The unbracketed figure against a given category is the number of students whose maximal condition while under observation falls into that category; the bracketed figure denotes the number of such students who had no tuberculous condition on first examination—i.e., who, had they remained the same, would have been finally classed in category F. The bracketed figures thus indicate persons who developed lesions subsequent to entry into the scheme. The total number of students observed is the sum of those in categories A–F. The total student-years of observation were calculated by multiplying the total numbers of students by their varying periods under observation in the scheme (period in scheme = interval between the first and the most recent X-ray examinations; in case of those who had only a single examination, this period was arbitrarily taken to be a month).

(iii) The percentages were obtained by dividing the unbracketed figures in column (ii) by the total number of students observed.

(iv) The rates were obtained by dividing the unbracketed figures in column (ii) by the total student-years of observation. The rates thus represent the average annual number of new cases per 100 students observed.

(v) The abbreviations used are: San., cessation of work and sanatorium (or hospital) treatment; R.L., restricted life but without cessation of work; N.L., normal life. The figures in this column are numbers, not percentages; those in brackets referring to persons who had no abnormality on first examination.

their preclinical years at University College, been under periodic examination by Dr. F. Ridehalgh in connexion with the Prophit trust research investigation of the Royal College of Physicians (a field investigation into pulmonary tuberculosis among young adults, embracing many population groups in London and the provinces). These "Prophit" students are statistically comparable with those who had never been previously under regular observation, for no preclinical student examined at University College under the Prophit scheme during this period was discovered to have changes indicating removal from the population group or even any alteration in his or her normal mode of life. The routine examinations of the "Prophit" students during their preclinical period had, however, included annual Mantoux testing (1/10,000 followed, if negative, by 1/100) besides radiography. This testing has been continued by Dr. Ridehalgh through the clinical course of these students in conjunction with the periodic radiography, the latter being repeated at six-monthly, instead of the standard yearly, intervals in the appreciable number of cases reacting negatively to the test. Thus the Prophit research scheme has dovetailed into the University College Hospital routine diagnostic service, and periodic Mantoux tests have been done on an unselected fraction (about a quarter) of the students in the present series.

CLASSIFICATION AND RESULTS

For the present purpose we do not intend to mention calcified primary foci, calcified tracheobronchial glands, apical scars, or equivocal parenchymal shadows. Only the more important pulmonary changes are recorded here. Pulmonary lesions that have apparently healed have been included only where these have been gross (covering more than two rib spaces). Accuracy of radiological interpretation in a given case has been greatly increased by the serial radiography, which permits first appearance and subsequent progression or regression of a lesion to be more readily appreciated than would a single film taken at any point in time.

In table II are set out the classification, numbers, and incidences of the various types of change, the incidences being based both upon total numbers of students examined (column iii) and upon total student-years of observation (column iv) under the scheme. Further, the advice given in each abnormal case (sanatorium or hospital treatment, restricted life without cessation of work, normal life) is tabulated as an indication of the seriousness attached to the lesion (column v). The bracketed figures in columns ii and v refer to students who showed no abnormality on first examination under the scheme but showed changes subsequently; they indicate what proportions of students arrived with lesions, and what proportions developed them in the hospital. The proportions thus indicated by the figures in brackets are, however, only minimal estimates, for (as table III

TABLE III—CASE DETAILS OF STUDENTS WITH IMPORTANT TUBERCULOUS CHANGES

Case	Sex	Age	Tb. condition 1st exam.	Earliest known tb. condition	Seniority at 1st exam.	Total years observed	Years observed after "maximal" condition detected	Seniority at onset of earliest known tb. condition	Clinical findings when "maximal" condition first detected	Advice given	Tb. condition last exam.	Detection due to—
TUBERCULOSIS CATEGORY A: "MAXIMAL" CONDITION = PULMONARY FLUFFY SHADOWS (F.S.)												
(i)	(ii)	(iii)	(iv)	(v)	(vi)	(vii)	(viii)	(ix)	(x)	(xi)	(xii)	(xiii)
1	M	21	F.S.	F.S.	0·3	3·3	3·3	< 0	Cough Sp. T.B. + No toxæmia S.R. normal Mantoux +	San.	Quiescent	Routine exam.
2	M	20	Recent spont. pneumothorax	Spont. pneumothorax	0·9	3·1	2·6	0·3	No symptoms S.R. normal	San.	„	„
3	M	20	Nil	F.S.	0·9	3·1	2·3	0·9–1·7	Diabetes No cough S.R. raised	San.	Quiescent (A.P.)	Symptoms (diabetes)
4	M	21	Nil	F.S.	0·4	3·2	2·3	0·4–1·3	Cough Sp. T.B. + S.R. raised	San.	„	Routine exam.
5	M	22	Nil	F.S.	0·3	3·3	0·3	2·3–3·3	No symptoms	R.L.	Just diagnosed	„
6	M	21	F.S.	F.S.	0·2	3·0	3·0	< 0	„	N.L.	? Healing	„
7	M	23	F.S.	F.S.	1·4	1·5	1·5	?	„	N.L.	Quiescent	„
8	M	22	Nil	F.S.	0·4	2·6	1·8	0·4–1·2	„	N.L.	„	„
9	M	19	Nil	F.S.	0·2	3·0	0	2·1–3·2	„	N.L.	Just diagnosed	„
10	F	22	F.S.	F.S.	0·7	2·5	2·5	< 0	Amenorrhœa No cough S.R. raised	San.	Active	„
11	F	22	Nil	F.S.; C.S.	0·6	2·7	0·2	2·1–3·2	No symptoms S.R. normal	R.L.	? Healing	„
12	F	20	F.S.	F.S.	0·7	1·3	1·3	< 0	No symptoms Mantoux +	N.L.	„	„
13	F	20	Nil	F.S.	0·1	1·1	0·2	0·1–1·0	„	N.L.	Just diagnosed	„
TUBERCULOSIS CATEGORY B: "MAXIMAL" CONDITION = PULMONARY "COIN" SHADOWS (C.S.)												
14	M	25	Nil	C.S.	0·1	2·5	0·3	1·1–2·3	No symptoms	N.L.	? Healing	Routine exam.
15	M	22	Nil	C.S.	0·1	2·5	0·4	1·1–2·2	„	N.L.	„	„
16	M	22	Nil	C.S.	0·1	1·4	0·2	0·1–1·3	No symptoms Mantoux +	N.L.	„	„
17	F	22	Nil	C.S.	0·7	1·4	1·0	0·7–1·1	Chest pain Mantoux +	N.L.	„	Symptoms
TUBERCULOSIS CATEGORY C: "MAXIMAL" CONDITION = PLEURISY												
18	M	20	Nil	Pleurisy	0·1	1·6	0	1·7	Chest pain Toxæmia Dry cough S.R. raised	San.	Just diagnosed	Symptoms
19	M	21	Recent pleurisy	„	0·1	2·6	2·6	< 0	—	R.L.	No development	—
20	M	22	Nil	„	0·3	2·6	2·3	0·6	Chest pain	R.L.	„	Symptoms
21	M	22	Pleurisy	„	0·3	3·2	3·2	0·3	„	N.L.	„	Routine exam.
22	M	23	Recent pleurisy	„	0·1	0·2	0·2	< 0	—	N.L.	„	—
TUBERCULOSIS CATEGORY D: "MAXIMAL" CONDITION = GROSS HEALED PULMONARY LESIONS												
23	M	23	Healed lesion	Pleurisy	3·0	0·8	0·8	< 0	No symptoms	N.L.	No development	Routine exam.
24	M	43	„ „	?	1·9	1·0	1·0	< 0	Catarrh Sp. T.B.–	N.L.	„	„
TUBERCULOSIS CATEGORY E: "MAXIMAL" CONDITION = NON-PULMONARY TUBERCULOSIS												
25	M	34	Recent nephrectomy	Renal tb.	11·0	0·3	0	9·0	Addison's syndrome	San.	Just diagnosed	Symptoms
26	M	21	Nil	Lumbar caries	1·8	2·3	0	4·1	Pain	San.	„	„

For further details and explanatory notes see next page

TABLE III: OTHER DETAILS

CASE 1.—Chest trouble suspected 0·8 yr. before entry. Fluffy and linear shadows 10 × 12 cm. R. upper and midzones on 1st exam., an increase as compared with film of 0·8 yr. before. At san. 0·5 yr., then R.L. Lost cough. Fibrosis in radiogram increased. S.R. remained normal throughout. Qualified, did house appointment.

CASE 2.—Small spont. pneumothorax R. apex, with pain, 0·3 yr. after entry to clinical course, 0·6 yr. before 1st exam. Radiogram had cleared by 1st exam. Multiple fluffy shadows over area of 5·5 × 4 cm. L. lower zone 0·5 yr. later, increasing. At san. 0·5 yr., with gold treatment, then R.L. No further increase of shadows. Qualified, did house appointment.

CASE 3.—Diabetes, accompanied by flame-like shadow 4·5 × 6 cm. extending outwards from L. hilum with cavity 2·5 × 2 cm. in centre L. midzone, discovered 0·8 yr. after 1st exam. Diabetes controlled, given A.P. At san. 0·3 yr., then R.L. Qualified. A.P. maintained. Cavity ? gone.

CASE 4.—Mottled fluffy shadow 3 × 2·8 cm. in periphery of L. midzone 0·9 yr. after 1st exam., with rapid progress to cavitation. At san. 0·5 yr., with A.P. treatment, then R.L. Lost cough. Qualified (university medal), did house appointments. A.P. maintained. Cavity gone, and linear scar has replaced lesion. (Figs. I–V on plate.)

CASE 5.—Known to have congenital absence of L. dome of diaphragm. Mottled fluffy shadow 3 × 3 cm. in L. infraclavicular region 3·0 years after 1st exam., spreading to L. supraclavicular region. Shadow decreased slightly on last exam.

CASE 6.—Group of fluffy shadows over area of 1·3 × 1·2 cm. R. midzone on first exam. Replaced by fibrotic strands stretching from R. hilum. Then fresh fluffy shadows R. midzone, followed by further fibrosis.

CASE 7.—Single fluffy shadow 1·2 × 1 cm. L. midzone on first exam. Disappeared, but later mottled shadow 2·5 × 2 cm. appeared in lower part of R. upper zone, smaller and more discrete on last exam. Two yrs. after last exam. said to be well.

CASE 8.—Single oval fluffy shadow 1·5 × 0·4 cm. in periphery of L. midzone 0·8 yr. after 1st exam. Increased to area of 2·8 × 3 cm. and then remained unchanged.

CASE 9.—Multiple small shadows R. supraclavicular region 3·0 years after 1st exam.

CASE 10.—Anorexia nervosa diagnosed (no radiogram) 0·2 yr. after entry to clinical course, 0·5 yr. before 1st exam. Had gained much weight since. Fluffy shadows R. supra- and infraclavicular regions on 1st exam. Preferred R.L. to san. Shadows coalesced to form cigar-shaped opacity 4·4 × 1·7 cm., gradually fibrosed (in 1 yr.) to single strand. S.R. remained raised. Qualified. Multiple fresh small fluffy shadows appeared in both supraclavicular regions. Lost weight again, and after last exam. ceased work and rested at home. (Figs. VI–XI on plate.)

CASE 11.—Coin shadow R. supraclavicular region, in conjunction with multiple fluffy shadows over area of 3 × 3·5 cm. R. infraclavicular region, 2·6 yrs. after 1st exam. Coin and fluffy shadows decreased on last exam.

CASE 12.—Fluffy and linear shadows R. supra- and infraclavicular regions on 1st exam. (known to have been present 1 yr. before). Shadows decreased, then increased slightly again.

CASE 13.—Group of small fluffy shadows R. lower zone 0·9 yr. after 1st exam.

CASE 14.—Rounded shadow 1 cm. in diam. R. lower zone 2·2 yrs. after 1st exam. Smaller but still present on last exam.

CASE 15.—Rounded shadow 1 cm. in diam. R. upper zone 2·1 yrs. after 1st exam. Increased to 1·3 cm. diam., then decreased but ? still present on last exam.

CASE 16.—Rounded shadow 1·2 cm. in diam. L. infraclavicular region 1·2 yrs. after 1st exam. (Mantoux had been neg. to 1/100 at 1st exam.). Shadow smaller and less definite margin on last exam.

CASE 17.—Rounded shadow R. infraclavicular region 0·4 yr. after 1st exam., ditto L. side 0·7 yr. later (Mantoux had been neg. to 1/100 at 1st exam., but site of test became red and swollen 0·2 yr. after.) Both shadows smaller on last exam.

CASE 18.—Pleurisy with effusion (R) 1·6 yrs. after 1st exam. (Mantoux pos. at 1st exam.). Hospitalised. ? will go to san. later.

CASE 19.—Pleurisy with effusion (R) 2 yrs. before entry to clinical course. Tented R. diaphragm on 1st exam. No further development.

CASE 20.—Dry pleurisy 0·3 yr. after 1st exam. No other development.

CASE 21.—Dry pleurisy (R) at time of 1st exam. "Sticky" diaphragm. No other development.

CASE 22.—Pleurisy with effusion (R) 2 yrs. before entry to clinical course; treated at san. Tented R. diaphragm on 1st exam.

CASE 23.—Recurrent pleurisy for 7 yrs. before 1st exam., last attack 1 yr. before. Multiple calcified shadows L. upper zone on 1st exam. No change in shadows and no further pleurisy attacks.

CASE 24.—Fibrotic shadow R. upper zone on 1st exam. No subsequent change.

CASE 25.—Nephrectomy for tuberculosis 9 yrs. after entry to clinical course, 2 yrs. before 1st exam. Chest radiogram clear on 1st exam. Addison's syndrome 0·3 yr. later. Chest still clear. Hormone and san. treatment.

CASE 26.—Lumbar caries 2·3 yrs. after 1st exam. Chest clear. Plaster and san. treatment.

Notes.—Entry, entry to clinical course; 1st exam., first examination under scheme; R.L., restricted life at work; San., sanatorium.

TABLE III: EXPLANATORY NOTES

Tuberculosis categories.—In assigning for each case its "maximal" tuberculous condition (the basis of categorisation A–E), fluffy shadows have been given precedence over the other pulmonary changes mentioned—e.g., coin shadows, pleurisy.

Col.

(iii) Age at time of 1st exam. under scheme.

(iv) Tuberculous condition on 1st exam. This gives an indication of whether the tuberculous trouble developed during the clinical course—e.g., case 4—or was already present at its beginning—e.g., case 1.

(v) Earliest known condition ascribable to tuberculosis. This may differ from "maximal" condition—e.g., case 2—or from condition on 1st exam.—e.g., case 3.

(vi) Years between entry to clinical course and 1st exam.

(vii) Years between the first and the most recent examinations. Shows total period of observation.

(viii) Years between first detection of "maximal" condition and last examination. Shows period for which the most important lesion was observed.

(ix) Years between entry to clinical course and onset of earliest known condition ascribable to tuberculosis (where the latter occurred before entry, this is recorded as < 0). This column shows more correctly than (iv) whether tuberculous trouble developed during the clinical course or was already present before entry.

(x) S.R., sedimentation-rate. Where Mantoux test is not mentioned it was not carried out.

(xi) San., sanatorium treatment or hospitalisation; R.L., restricted life but without cessation of work; N.L., normal life.

(xii) Condition of tuberculous lesion at most recent examination under scheme.

shows) certain of those recorded as having lesions on first examination had already been studying at the hospital for some time and may therefore still have developed their trouble after the beginning of their clinical course though before their first examination under the present scheme.

Table II brings out the following points:—

(1) Of the 349 male and 68 female students examined, 21 and 5 respectively showed important tuberculous changes (categories A–E) during the three-year period under review, representing incidences of 6·1 and 7·4 per cent. and case-rates of 4·1 and 5·0 per 100 years of observation. Of these 26 cases, 7 men and 1 girl were advised cessation of work and sanatorium (or hospital) treatment, 3 men and 1 girl were advised restricted life but without cessation of work, and the remaining 11 men and 3 girls were advised to pursue normal lives under closer observation than average.

(2) The commonest and probably also the most important of the various pulmonary changes tabulated is pulmonary fluffy shadows (category A: 9 males, 4 females). Half of the cases in this category (5 of

LEGENDS TO ILLUSTRATIONS

(*see opposite page*)

I—Normal lung field (case 4, 1st exam., 17.iii.36).

II—Mottled fluffy shadow (3 × 2·8 cm.) in periphery of left midzone with increased linear shadows stretching to left hilum (case 4, 15.ii.37).

III—Increase in size of mottled shadow shown in fig. II (case 4, 9.iii.37)

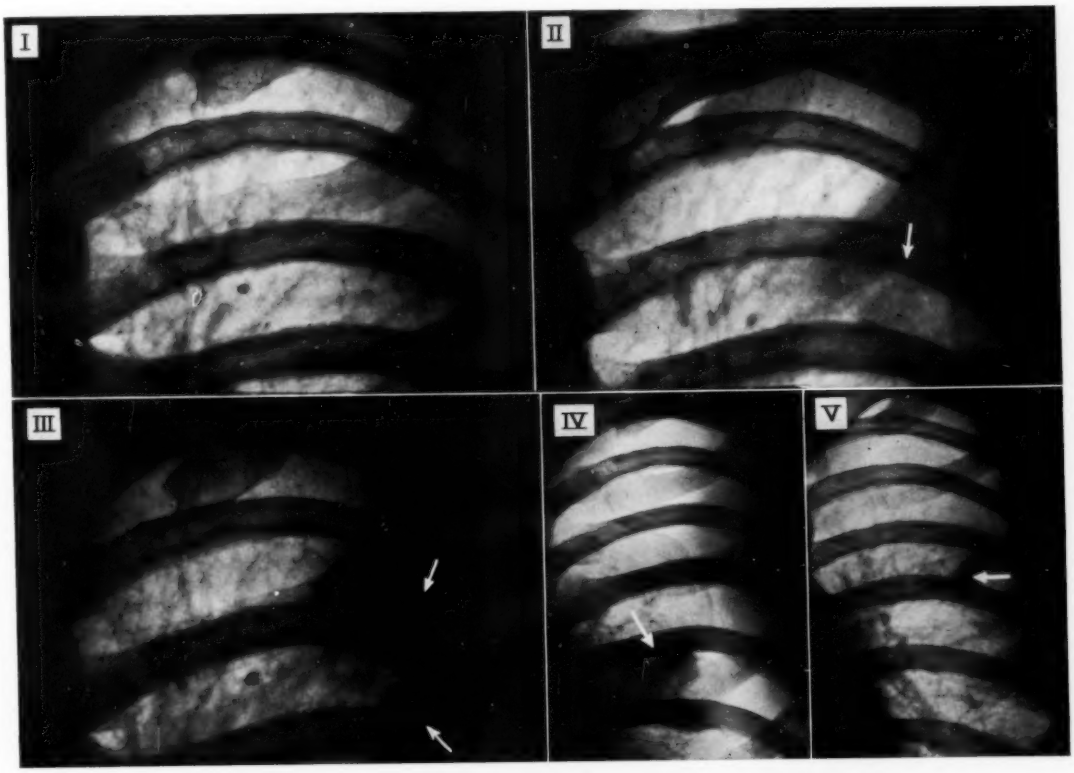
IV—Partial pneumothorax on left side with cavitation in region of lesion (case 4, 11.xi.37).

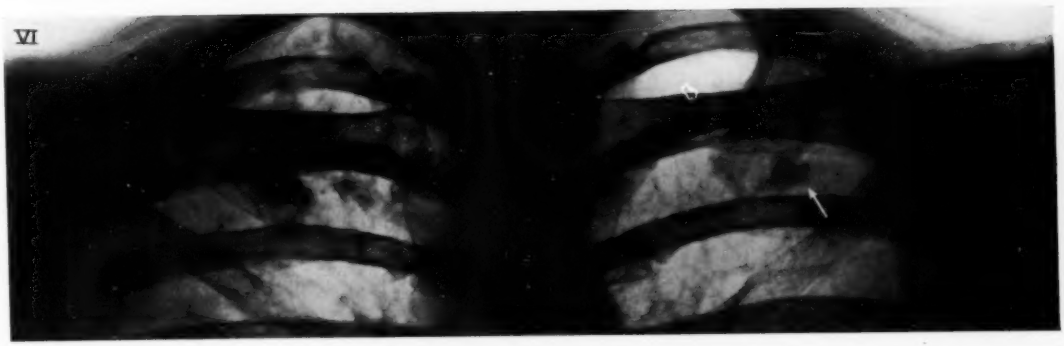
V—Almost complete re-expansion with linear scar replacing cavity (case 4, 30.v.39).

VI—Multiple fluffy shadows in right supraclavicular region, extending downwards to the infraclavicular region; one fluffy shadow in left infraclavicular region (case 10, 1st exam., 9.vi.36).

VII—Coalescence of many of the fluffy shadows in right supraclavicular region to form a cigar-shaped opacity (4·4 × 1·7 cm.); breaking up of shadow in left infraclavicular region into several small shadows (case 10, 11.viii.36).

DRS. HART, HILTON, AND MORLAND: TUBERCULOSIS IN MEDICAL STUDENTS



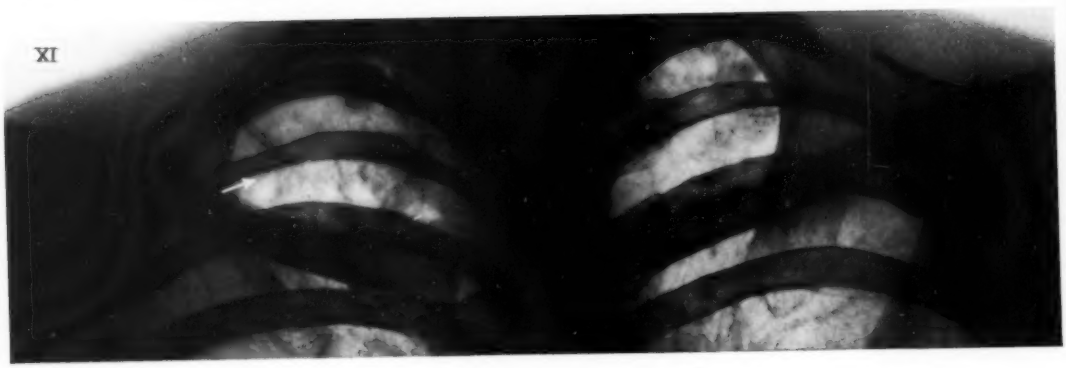


VIII

IX

X

XI



the 9 males, 2 of the 4 females) showed no tuberculous abnormality on first examination under the scheme and presumably, therefore, developed their first tuberculous lesions during their clinical course. This proportion is, however, a minimal estimate (see discussion of table III).

(3) The other interesting change noted is pulmonary "coin" shadows (category B: 3 males, 1 female), all appearing subsequently to first examination.

(4) Five students have been placed in the category of pleurisy, 2 others in that of healed lesions, and 2 others in that of non-pulmonary tuberculosis.

(5) The incidences of pulmonary fluffy shadows and of "coin" shadows, based upon total students, and the case-rates of these two changes, based upon total student-years of observation, are higher for females than for males (incidences: males 2·6 and 0·9, females 5·9 and 1·5; case-rates: males 1·7 and 0·6, females 4·0 and 1·0). Since the total numbers are small, these sex differences must be accepted with caution.

(6) Of the 8 students advised sanatorium treatment, 6 had pulmonary and 2 non-pulmonary tuberculosis. Of the 6 pulmonary cases 5 were in category A (pulmonary fluffy shadows) and 1 was pleurisy with effusion.

In table III are set out the details of the 26 cases with important tuberculous changes. In this table the primary arrangement is according to categories (A–E). Within each category all males are placed first, their individual order depending on the seriousness attached to the case—i.e., on the nature of the advice given.

Examination of table III permits of expansion of some of the findings of table II and brings out additional points:

(1) In the discussion of pulmonary fluffy shadows (category A) above, 5 of the 9 males and 2 of the 4 females were given as minimal figures for the numbers that had developed their first tuberculous trouble during the clinical course, all of them being recorded (table III, column iv) as "nil" on first examination. However, case 2, recorded on first examination as "recent spontaneous pneumothorax," developed this condition (as well as the later fluffy shadows) after entry to the clinical course, though before his first examination under the scheme (the discrepancy arising from the considerable interval between the two dates (see column vi)). This is indicated in column ix, where the approximate interval in years between entry to clinical course and onset of earliest known condition ascribable to tuberculosis is given for each case. From column ix it is possible to correct the above estimates (see table II) for the number of students who developed their first tuberculous condition during the clinical course. For pulmonary fluffy shadows the number is 6 or possibly 7 of the 9 males (cases 2, 3, 4, 5, 8, 9, and ? 7) and 2 of the 4 females (cases 11 and 13), the remainder (cases 1, 6, 10, and 12) having presumably brought their trouble with them. All of the 4 students with pulmonary "coin" shadows (category B) developed this change during the clinical course. In 2 of the 5 students with pleurisy (category C) the attacks (with effusion) had taken place before entry to the clinical course, and in the other 3 (2 with dry pleurisy, 1 with effusion) they took place during the clinical course. Both cases classed as healed lesions (category D) arose from trouble before entry to the clinical course, and both students with non-pulmonary tuberculosis (category E) developed this after entry. The above figures together mean that in 17 or possibly 18 (as against the minimal estimate of 14 made in table II) out of the total 26 students with tuberculous changes the condition had its onset during the clinical course, whereas in the other 9 it may be deemed to have originated previously. Finally, it may be noted that, of the 8 students advised sanatorium treatment, the onset of tuberculous trouble must be assigned to the clinical course in 6 (cases 2, 3, 4, 18, 25, and 26) and to an earlier period in only 2 (cases 1 and 10).

(2) Column ix of this table also shows that the point in the clinical course at which the earliest trouble developed in the different cases was very variable and cannot be said to have been restricted to any particular year of seniority.

(3) The type, position, and course of the pulmonary fluffy shadows were very varied (see "other details"). For example, in certain cases the appearance was of a group of multiple small fluffy opacities (cases 2, 6, 9, 11, and 13); in others there was a larger mottled shadow (cases 4, 5, and 7); in others there were combined linear and fluffy shadows (cases 1 and 12); and in the remainder (cases 3, 8, and 10) the appearance cannot be described under any of these headings. In half the cases the fluffy shadows appeared first in the middle or the lower zones, and in the remainder they were in the upper zones or apices. As regards their course, certain of the lesions seemed of "chronic" type (cases 1 and 12); 2 were accompanied by, or progressed rapidly to, cavitation but reacted well to collapse therapy (cases 3 and 4); and certain others have shown over periods of months alternate progression and regression with fresh shadows sometimes appearing elsewhere (cases 6, 7, and 10). This instability, which seems of special interest, is particularly well shown in case 10, in which fluffy shadows (present on first examination) occupying the right supraclavicular and infraclavicular regions could be observed to coalesce to form a cigar-shaped opacity, which gradually fibrosed to a strand-like shadow ("apical scar"), after which multiple fresh fluffy shadows appeared at both apices (figs. VI–XI).

(4) The clinical accompaniments of the pulmonary fluffy shadows were also varied (see column x). Taking first the 5 students advised sanatorium treatment (cases 1, 2, 3, 4, and 10), on first detection 1 had diabetes and 1 was recovering from anorexia nervosa, but neither of these had chest symptoms; 2 others were sputum-positive but had minimal symptoms otherwise; and 1 had recently had a spontaneous pneumothorax but was symptomless when the fluffy shadows were first detected. It may be noted (see column xiii) that the detection of fluffy shadows must be ascribed to the systematic routine examinations of the scheme in 4 of these 5 "sanatorium" cases; and only in 1 can it be attributed to complaint because of symptoms, and even in that case the symptoms were not referable to the chest but were those of the accompanying diabetes. The students with pulmonary fluffy shadows recommended restricted or normal life without cessation of work, who were twice as numerous as those advised sanatorium treatment, had, like the latter group, when first detected, minimal symptoms referable to the chest.

(5) The outcome of the pulmonary fluffy shadows in those students who accepted sanatorium treatment—4 of the 5 so advised—has been satisfactory. All have returned to work on restricted life and have since passed their qualifying examinations; and the lesions are now considered to be quiescent (with pneumothorax still maintained in 2 cases). The student with

LEGENDS TO ILLUSTRATIONS

(see opposite page)

VIII—Diminution in size and increase in density of cigar-shaped opacity; no change in size of shadows in left infraclavicular region (case 10, 15.ix.36).

IX—Partial replacement of cigar-shaped opacity by strands; appearance of small rounded shadow in left supraclavicular region (case 10, 2.ii.37).

X—Disappearance of greater part of cigar-shaped opacity, a few coarse strands still being present; upper and outer part of left supraclavicular region now covered by soft shadow (case 10, 21.ix.37).

XI—Several fine strands still visible in outer part of right supraclavicular region; reappearance of multiple fluffy shadows in inner part of right supraclavicular region and also over whole of left supraclavicular region (case 10, 16.ii.38).

anorexia nervosa was unwilling to accept sanatorium treatment but eventually, after qualification, was persuaded, in view of increase in the shadows and loss of weight, to cease work and to rest at home, with further results not yet known. The students with pulmonary fluffy shadows who were primarily advised restricted or normal life without cessation of work have also had satisfactory experience to date, any progression of lesions having been of limited extent and not to a stage suggesting serious activity. However, where the lesions have been only recently detected, the period of observation is obviously too short to allow of any definite conclusion as to the probable outcome.

(6) The nature of the pulmonary "coin" shadows is of interest. Three of the cases were symptomless, and 1 student complained of chest pain. The rounded shape of the shadows, the absence of apparent calcification, and the tendency to regression, suggest that they represent recent primary foci. This view is supported by the fact that, in 2 of the present series in which Mantoux tests had been carried out by Dr. Ridehalgh under the Prophit scheme, the appearance of the "coin" shadows accompanied or followed shortly after the change of tuberculin reactivity from negative to positive.*

GENERAL DISCUSSION

The essential feature of a scheme such as has been described is periodic radiography combined with careful history-taking, to which periodic Mantoux testing may be added with advantage. Comparability of the radiograms is important, for the possession of a series of comparable films of a given case enables the development or the progression or regression of abnormal shadows to be much better recognised than if a single film alone is available and a general idea of average normality has to be relied on for a standard.

If it is agreed that (1) the success of treatment in tuberculosis depends greatly on the stage at which it is instituted; (2) the earliest evidence of progressive pulmonary tuberculosis is radiological and is least equivocal where a previous normal radiogram is available; and (3) early recognition is likely to be best attained by examining the patient while still in apparent health rather than by waiting for him to complain to his doctor, then a scheme of the present type for the periodic examination of students at regular intervals is justifiable.

The correctness of this view has been brought out in practice by the experience of University College Hospital. During three years 5 persons out of an average population of about 250, with a gradually changing make-up, have been discovered to have undoubtedly progressive pulmonary lesions requiring treatment: case 1 was sputum-positive, case 2 showed the lesion shortly after spontaneous pneumothorax, case 3 had cavitation, case 4 had cavitation and a positive sputum, and case 10 showed a persistently raised sedimentation-rate. That special action was justified in these cases can hardly be disputed. In all of these cases the accompanying symptoms referable to the chest were minimal. In 4 the lesions were discovered at the routine examination and without such a service would not have been detected until the symptoms had become significant enough to be recognised by the student or severe enough for him to complain to his doctor. In all the cases, however, the lesions were localised and could be said to be in an early stage. Moreover, the 4 students who accepted sanatorium treatment have all returned to work and subsequently passed their qualifying examinations, their lesions having become quiescent.

The presentation of results has been undertaken here in some detail, because a scheme for the control of tuberculosis among medical students by periodic medical examination does not appear to have been previously used in this country. Similar schemes have, however, been recently introduced for the staffs of certain tuberculosis institutions, though published reports of these are not yet forthcoming.† On the Continent and in America services for various adult groups have been instituted in many centres. Such services vary, as might be expected, in their intensiveness and scope.

Bernard (1938) and Sayé (1938) describe some of the European schemes; and general surveys of the American schemes, as applied to medical students and to pupil nurses, are given by Soper and Amberson (1939) and in a report by the tuberculosis committee of the American Student Health Association (1939). As examples of highly satisfactory tuberculosis diagnostic schemes in Europe may be mentioned the scheme for nurses at the Ullevaal Hospital, Oslo (Heimbeck 1936), the student service at Copenhagen (Holm and Helweg-Larsen 1938), the service for students of the University City, Paris (Bernard 1938), and the schemes for the French Army (Jullien, Sieur, and Dutrey 1937). For the United States special mention may be made of the tuberculosis division of the student health service of the University of Minnesota (1939), the scheme for the nurses employed at the Glen Lake sanatorium of the same state (Mariette 1936), and the health service for the employees of the Metropolitan Life Insurance Co., New York (1935, 1939). In France a sanatorium for students exists at Saint-Hilaire-du-Touvet (Bernard 1938), and the tuberculous employees of the Metropolitan Life Insurance Co. (1938, 1939) are treated at the company's private sanatorium at Mt. McGregor, N.Y., whence they return to their work.

The present results raise important questions regarding tuberculosis among young adults in this country. Precise information is needed about the present incidence both of tuberculin sensitivity and of tuberculous lesions among different sections of the young adult population, and about how far the development of progressive pulmonary tuberculosis is related to the pre-existing tuberculin reactivity. The planning of the large-scale Prophit trust research investigation of the Royal College of Physicians, already mentioned, has been made with such questions in view, and the results of that inquiry will be awaited with great interest.

SUMMARY

(1) The administrative routine and results of the diagnostic service for pulmonary tuberculosis in operation for students taking their clinical training at University College Hospital medical school are described. The scheme consists of periodic radiography combined with history-taking and latterly (as a part of the Prophit research scheme) with Mantoux testing. The average population at risk has been about 250, with a gradually changing make-up.

(2) Between February, 1936, and June, 1939, out of a total of 417 students examined—with a total of 625 student-years of observation—the number of students showing lesions considered of importance has been 26 (making an incidence of 6·2 per cent. and a case-rate of 4·2 per 100 years of observation). In 17 of these 26 cases the lesions are believed to have had their onset during the clinical course, and in the other 9 to have originated previously. The 26 cases have

* In none of the present series was erythema nodosum seen, though admittedly the students were not particularly questioned at each routine examination as to the presence of this condition during the previous interval.

† Thus Dr. Peter Edwards (personal communication) states that since 1935 in the Cheshire Joint Sanatorium all the staff are tuberculin-tested and are radiographed at regular intervals.

been subdivided into pulmonary fluffy shadows (13); pulmonary "coin" shadows, considered to represent early primary foci, (4); pleurisy (5); gross healed pulmonary lesions (2); and non-pulmonary tuberculosis (2).

(3) Of the 26 students, 8 were advised sanatorium or hospital treatment, 4 were advised restricted life without cessation of work, and 14 were recommended to pursue normal lives under closer observation than average. Of the 8 "sanatorium" cases, 5 were pulmonary fluffy shadows, 1 was pleurisy with effusion, and 2 were non-pulmonary tuberculosis. All of these 8 students, except one of those with pulmonary fluffy shadows, accepted the advice given.

(4) Of the 5 students with pulmonary fluffy shadows advised sanatorium treatment, 2 showed cavitation (1 with positive sputum), 1 had a fibrocaseous lesion with positive sputum, 1 had previously had a spontaneous pneumothorax, and 1 showed a persistently raised sedimentation-rate. In all these cases, however, the symptoms referable to the chest when the fluffy shadows were first discovered were minimal, and in 4 of them the discovery was due to the systematic routine examinations of the scheme, in only 1 being due to complaint of symptoms (those of accompanying diabetes).

(5) The type, position, and course of the pulmonary fluffy shadows have been very varied. A point of interest is the apparent instability of some of the less serious lesions, progression being followed by regressions, and this in turn being followed by the appearance of fresh shadows.

(6) The progress of the students with pulmonary fluffy shadows accepting sanatorium treatment (4 of the 5 so advised) has been satisfactory. All the lesions were of limited extent, and those with cavitation reacted well to pneumothorax therapy. All these students returned to work and have since qualified. The progress of the students advised restricted or normal life without cessation of work has so far also been satisfactory.

(7) The response to the present voluntary scheme among the students eligible for enrolment has been over 98 per cent., and the results have fully justified the expense and effort involved. At the request of the students it is intended, so far as possible, to continue this service during the war, in spite of the increased difficulties.

We wish to express our indebtedness to the committee of University College Hospital medical school, in particular to Mr. Gwynne Williams, the dean, the late Prof. Wilfred Trotter, and Prof. T. R. Elliott, for advice and encouragement during the progress of the scheme; to the students and the resident officers for welcoming it as a service and not as an imposition; to Dr. F. Ridehalgh for allowing us to examine those radiograms taken under the Prophit research scheme and to use the results of certain of his Mantoux tests; and to Dr. Charles Newman for criticism of the manuscript.

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HEMIPLEGIA COMPLICATING SODIUM DIPHENYL HYDANTOINATE THERAPY OF EPILEPSY

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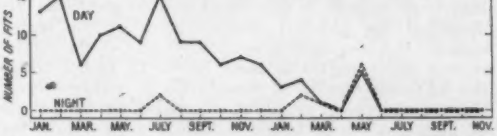
This seems to be the first recorded case of hemiplegia as a major toxic complication of the treatment of epilepsy with sodium diphenyl hydantoinate. It also illustrates the fact that even after months of freedom from fits and with no ill effects (due to its administration) this drug must still be considered potentially toxic, and it re-emphasises the danger of increasing the dose to arrest a series of fits developing after a long period of complete freedom from them due to the anticonvulsant properties of the drug. The latter two points have already been emphasised by Blair, Bailey, and McGregor.[1]

CASE-RECORD

The patient was a female aged 34 with grand-mal epilepsy associated with psychosis. There was no family history of insanity or epilepsy, but the father, whose character was of doubtful repute, deserted the mother and the children, when the patient was a year old, and has never been heard of since. The patient was taken in charge by the local board of guardians. After leaving school she worked for a while at a local hostel for girls, but at the age of 20 she began to have epileptic fits, which necessitated care in special institutions. She was in one of these for five years and then, owing to her quarrelsome attitude to others, confusion and violence following fits, and generally psychotic bearing, was certified as insane and admitted to Cane Hill Hospital on Oct. 19, 1935.

On admission she had bilateral coloboma and convergent strabismus. Otherwise she appeared physically fit and could see well enough to get about by herself. She was somewhat mentally deficient. She



Incidence of fits from January, 1938, to November, 1939.

had frequent epileptic fits, always preceded by an aura ("a funny feeling in the head") and often followed by confusion and restlessness. She had a typical epileptic temperament, being querulous, quarrelsome, egotistical, and often embroiled in aggressive violence against the other patients.

She was put on Luminal gr. 1 twice daily. On this she continued to have many fits, and on Jan. 25, 1939, treatment was altered to Epanutin 1 capsule, thrice daily. She continued to have fits off and on for the next three months but then had a complete absence of fits for six months (see figure). At the end of this period, on Nov. 23, 1939, she started fits again. Her sequence of fits from this day onwards is recorded in the accompanying table.

On the 30th the dosage of epanutin was increased to 1 capsule four times a day by the doctor then in charge of her with the idea of reducing the number of fits by increased anticonvulsant effect. The reverse result to that intended was dramatic (see table). On Dec. 1 epanutin was withdrawn, and this fact probably had more to do with subsequent improvement

1. Blair, D., Bailey, K. C., and McGregor, J. S., *Lancet*, 1939, 2, 363.

than all the other medications put together. Chloral hydrate gr. 15 four-hourly was given. The patient became more confused and restless between fits. On the 2nd there were further fits. An enema was given, with no effect on the number of fits. An intravenous injection of Evipan 10 c.cm. was given at 6 A.M. and another at 10 P.M. Fits gradually became less frequent. Temperature 102·4° F., pulse-rate 154, respiration-rate 44.

On the 3rd the fits had stopped, but now there was a right-sided hemiplegia accompanied by what was apparently a trophic blistering of the right hand and fingers very similar to a superficial burn. The patient was still very restless on her left side. Temperature subsided during the day. On the 4th the temperature, pulse-rate, and respiration-rate were normal. No further fits. Patient was dazed and semi-stupid but moved her right side freely. Right plantar responses extensor. On the 5th she was speaking again, and there was general improvement. Plantar responses both extensor.

On the 6th she was put on luminal gr. 1½ thrice daily. Since then her condition has gradually improved, she is now back to her normal self, her hemiplegia has completely disappeared except for a residual right plantar extensor response, the blisters have completely healed, and she can walk by herself with no excessive limping or dragging of the right leg, although she says she feels weaker on the right side than on the left.

INCIDENCE OF FITS FROM NOV. 23, 1939

Treatment	Epanutin: one capsule thrice daily							Epanutin: 1 capsule four times a day	Chloral hydrate gr. 15 four-hourly	Evipan 10 c.cm. at 6 A.M. and 10 P.M.	—		Luminal gr. 1½ thrice daily	—
Date	Nov: 23	24	25	26	27	28	29	Nov. 30	Dec. 1	Dec. 2	Dec. 3	4	5	Dec. 6	No fits since
Day	0	1	0	0	0	0	1	6	15	17	0	0	0	0	
Night	0	0	0	1	2	0	2	10	11	1	0	0	0	0	

COMMENTS

That the hemiplegia in this case was due either directly or indirectly to epanutin seems certain. If indirectly, it might have been through a minute cerebral hæmorrhage brought on during her many fits. These fits were very strong, and her only recollection of the whole affair is that she had fits considerably more severe than usual. This information she volunteered spontaneously when questioned about her memory of her acute phase. The rapid increase in fits and toxicity after the increase of epanutin to 4 capsules a day and the improvement after its complete withdrawal speak for themselves.

MEDICAL SOCIETIES

MEDICAL SOCIETY OF LONDON

AT a meeting of this society on Jan. 29, with Mr. V. ZACHARY COPE, the president, in the chair, a lecture on some

Physiological Problems of Human Flight

was given by Group-Captain G. STRUAN MARSHALL. He said that these problems can be roughly divided into those related to movement and to position. He described the physical characteristics of the troposphere—the immediate atmosphere—and of the stratosphere, which begins at about 36,000 ft. and in which the physical conditions remain at a uniform level. One of the chief problems of combating the effects of high altitude is to get sufficient oxygen into the blood when the partial pressure in the inspired air is too feeble. At about 18,500 ft. the partial pressure of oxygen is about half the figure at ground level. The altitude-pressure curve is complex up to the beginning of the stratosphere but afterwards is a pure logarithmic curve. As the inspirate is humid, 45° of extra pressure has always to be allowed for. If pure oxygen is breathed at 39,000 ft., the lungs will receive as much as they will if air is breathed at about 10,000 ft. The limit of endurance is about 20,000 ft. with air and 44,000 ft. with oxygen breathed through an open apparatus. It is not dangerous to breathe pure oxygen even on the ground, for the maximum saturation in the arteries is only about 96 per cent.

The partial pressure of inspired oxygen at high altitudes can be raised by adding oxygen to the air breathed and thereby raising its volumetric proportion, or by enclosing the flyer in an airtight suit or cabin and supplying him with air or a weak oxygen mixture at a higher pressure than that of the atmosphere. Experiments have shown that the flyer remains well up to about 37,000 ft. if supplied with oxygen, but at 40,000 ft. oxygen-want is shown in the handwriting by reduplication of syllables and misspelling. The effects of cold are quite distinct, and it is not necessary to carry out experiments in cold air. Captain Marshall showed slides of the experimental chambers in use and their equipment with telephones and oxygen generators, and with daylight-blue lighting so that incipient cyanosis can be observed. An oxygen suit which has given good results in practice is made of flexible but strong rubber material in two pieces. An airtight joint is formed at the waist by pressure between an internal and an external steel band, and the helmet is fitted with a quick-release valve. The suit can be inflated, and will stand almost a perfect vacuum. An automatic device circulates oxygen and removes carbon dioxide and moisture.

The chief problem connected with movement is to counteract the effects of acceleration and centrifugal force. A pilot diving under power is travelling at an approximately uniform pace in a straight line. When the aircraft is deflected from that line, the weight of everything in it increases because of the new force applied at right-angles to its direction. Military aircraft commonly encounter forces equivalent to four times the pull of gravity—in the technical formula, 4 G_1. Military pilots consider that their fighting efficiency would be increased if they could endure accelerations up to 8 or 10 G, when a man weighs about a ton. The commonest symptom of excessive acceleration is "blacking-out," known to the Germans as the "*Vorhang*," or curtain. A certain degree of acceleration maintained for a certain time—Captain Marshall stressed the great importance of the time factor—causes dimming of the vision progressing to blindness, without loss of consciousness. The average pilot can stand between 3 and 6 G; a highly-experienced man up to 7 or 8 G. Bending the body forward and tightening the muscles will alleviate the effect. If the pressure is continued for long the pilot will faint. The symptoms are caused by the movement of the body-fluids into the splanchnic area, which is expansile. The Germans disagree with this explana-

tion and say that the pooling is in the vessels of the legs, but this theory is unlikely, because air pilots have highly-trained leg-muscles. This problem would be solved by developing some means of preventing blood from being accumulated in the belly. Experiments are offering considerable hope, but their nature is still secret.

In reply to questions, Captain Marshall said that a pilot is told to put his chin on his chest when power-diving because this action, if done vigorously, is associated with contraction of all the voluntary muscles, which resists the inflow of blood to the abdomen. It also reduces the hydrostatic head—the fluid fall between the brain and the belly. A reduction of this head by two inches will reduce the likelihood of blacking-out by a much greater proportion, for the belly will stand a considerable hydrostatic pressure before symptoms appear. Pilots are advised to scream loudly in order to tighten the abdominal muscles. The blood-pressure is unaltered at high altitudes so long as the oxygen pressure is sufficient to oxygenate the blood. Bleeding at the ear may be due to failure to equalise the pressures inside and outside the tympanic membrane. If the Eustachian tube is patent, the pressure will be equalised through it; if it is closed, the air will ooze out of it as it expands with the increase in altitude, but on descent the air will not re-enter it, and the membrane will be driven inwards with terrific force. If the dive is sudden, it may split. He could not explain nose-bleeding. To fly with the windscreen down may add about 20 mm. of pressure, an inconsiderable amount. He showed a table indicating the relations between speed, turning-circle and the G factor, and pointed out that when an aircraft travelling at 350 miles an hour turns through a circle a mile in diameter, the acceleration is about 3·5 G—at the threshhold of tolerability. One pilot who had been accidentally subjected to 13 G never recovered. Venous pressure does not appear to alter, and no pulmonary complications have been observed.

Asked if there is any limit to vertical speed, Captain Marshall replied that when a moving body approaches the speed of sound it becomes subject to entirely different aerodynamic principles, and no body designed and constructed like present-day aircraft could exceed that speed, at which air is practically solid. It is strictly forbidden to "bunt" a service plane—i.e., to turn it on to its back out of a vertical dive: this drives blood into the head and a pilot can endure only a small rise of intracranial pressure. The symptoms may be related to the condition commonly described as "seeing red." The cause of temporary blindness due to acceleration is probably a fall in the arterial pressure in the neighbourhood of the eye to a point at which the blood can no longer overcome the intra-ocular pressure of 20–25 mm.

REVIEWS OF BOOKS

Gynæcology

By HERBERT H. SCHLINK, M.B. Sydney, F.R.A.C.S., lecturer and examiner in gynæcology in the University of Sydney; senior hon. gynæcological surgeon to the Royal Prince Alfred Hospital, Sydney. London: Angus and Robertson. 1939. Pp. 557. 32*s.* 6*d.*

THIS is a worthy product of that wide Australian school which owes so much to the author. The book is primarily intended for the student, but not just as an examination passer, for it inspires a deep interest in the subject. Redundancy and repetition have been carefully but ruthlessly pruned away, though not at the expense of the pathological material which is so essential for the proper conception of gynæcology. It is only lately that the importance of histology has been recognised in the elucidation of many problems of uterine malfunction and Schlink lays due stress on this aspect.

The main arrangement of the text follows accepted English principles. There are at the end two excellent chapters on operative gynæcology and postoperative complications. Radium—probably because it is not so readily available in Australia—and radiotherapy are not given the full measure of their merits, and the technique of application differs rather from ours. For instance, Schlink advises the excision of venereal warts, which so readily respond to radiotherapy. Again, his radium treatment of cervical cancer is a little sketchy and old-fashioned. It is unfortunate that for congenital absence of the vagina operations are described which the plastic surgeon, using McIndoe's technique, has relegated to the historical limbo. In the treatment of prolapse the author advises a complicated operation which is a combination of the Fothergill plus an abdominal ventrosuspension; all thinking gynæcologists must condemn this as dangerous and unnecessary, for a properly performed Fothergill should always antevert a retroverted uterus. These small criticisms do not affect the otherwise sound teaching of this readable and sensible book.

The Louse

An Account of the Lice which Infest Man, their Medical Importance and Control. By PATRICK A. BUXTON, M.A., L.R.C.P., D.T.M. & H. director, department of medical entomology, London School of Hygiene and Tropical Medicine; professor of medical entomology, University of London. London: Edward Arnold and Co. 1939. Pp. 155. 7*s.* 6*d.*

WAR has brought the louse into the limelight again as a potential menace to the health of armies in the field, and the evacuation of children has further called attention to the widespread infestation with head-lice that exists among the civil population. During the last war there was no lack of interest in the louse in any country involved. For the armies and civilians in the East were decimated by typhus, and although, for some reason that has never been fully understood, typhus fortunately did not appear on the western front, the general infestation with lice caused much discomfort there, and the heavy incidence of the louse-borne trench fever was responsible for high rates of sickness. These circumstances called forth a mass of research, of variable quality, and we finished the war with a greatly increased knowledge of the louse and how to deal with it. It is clear from Professor Buxton's comprehensive monograph that, with regard to the control of lice, almost nothing has been added since that time. Knowledge gained in other fields of entomological research should therefore be brought to bear as soon as possible upon the human louse. Meanwhile this book provides an admirable statement of existing knowledge of the anatomy, physiology and natural history of the louse, the insecticidal methods applicable to it, and the practical means for utilising these methods in different circumstances. Professor Buxton fully describes the relation of lice to relapsing fever, typhus and trench fever, and gives an up-to-date account of the development of the rickettsias and spirochætes in the louse. He concludes with a chapter on the crab louse, phthirus, and an appendix on the

technique of rearing lice for experimental purposes. The book is nicely illustrated and thoroughly readable.

Asthma and the General Practitioner

By JAMES ADAM, M.A., M.D., F.R.F.P.S., surgeon-in-charge, asthma clinic, Stobhill Hospital, Glasgow; surgeon for diseases of ear, nose and throat, Lanarkshire County Council Hospitals. London: Baillière, Tindall and Cox. 1939. Pp. 158. 6s.

THIS handbook deals with asthma from the clinical point of view, largely neglecting the allergic aspect, and discusses the treatment of the patient rather than his symptoms. It records the personal observations of an otolaryngologist in treating some 2000 cases over a period of forty years. He asserts that the mass of literature on allergy, with its cumbrous terminology, has not greatly eased the problem of handling most asthmatics. Nevertheless, there is hardly a page in which allergy is not mentioned. Dr. Adam stresses the influence of nurture and environment in producing asthma—a toxicosis due to bad habits as to food and indoor life—but he admits there are cases where nature (heredity) is a dominating factor. He gives some sound advice on the psychological factors and the treatment of the nose. The practitioner might well ponder his statement that "there are drugs that relieve, but none that cure asthmatics. The more certain they are in relieving the symptom asthma, the more certain are they, if alone trusted, to hinder cure, for not only do they tend to make addicts, but they tend to distract from the general treatment, which aims at changing the asthmatic soil." The dangers of giving aspirin or morphia to some asthmatics are ably brought out, as is the fact that a careful history is more important than the physical examination.

British Journal of Surgery

The January issue (vol. **27**, No. 107) contains the following articles:

AN UNUSUAL CASE OF OBSTRUCTION TO THE COMMON BILE-DUCT (CHOLEDOCHOCELE ?). By Sir W. I. de Courcy Wheeler (London). By analogy with ureterocele obstructing the lower end of the ureter, the author tentatively explains his case as caused by a cystic dilatation of the intraduodenal portion of the common bile-duct, obstructing its opening at the ampulla of Vater.

SENSIBILITY IN THE ABDOMEN. By Victor J. Kinsella (Sydney). Forty cases of appendicitis were operated on under local anæsthesia. The sensitivity of the anterior parietal peritoneum was confirmed; the posterior peritoneum was sensitive in 9 out of 19 cases. Ligation of the mesentery caused pain, as did also squeezing of the inflamed appendix. The visceroparietal reflexes of Mackenzie are defended.

THE REMOVAL OF LARGE SPLEENS. By Arnold K. Henry (London). Delivery of the organ head first; division of adhesions by means of the high-frequency cautery; the posterior approach to the pedicle (where possible); and the use of an inflated toy balloon to fill the subdiaphragmatic hollow left after splenectomy are the main points in the author's technique.

JEJUNOGASTRIC INTUSSUSCEPTION. By Ralph Shackman (London). Two clinical types are described. Intussusception of the afferent loop produces attacks of postprandial upper abdominal pain, with exacerbations of colic with vomiting and possibly with hæmatemesis. When the efferent loop is involved, the symptoms are those of high-bowel obstruction. The treatment is open reduction by gentle traction.

DISLOCATION OF THE INFERIOR RADIO-ULNAR JOINT AS A COMPLICATION OF FRACTURE OF THE RADIUS. By Geoffrey Hyman and F. R. R. Martin (Leeds). Dislocation of the head of the ulna is said to take place in a direction opposite to that of the original violence. The radius is avulsed from its attachment to the ulna, and driven backwards by a fall on the outstretched hand, or forward by a blow or fall on the posterior surface of the wrist or hand. Reduction was easy. Diagnosis and prognosis is discussed.

ÆTIOLOGY OF HALLUX RIGIDUS. By E. A. Jack (Edinburgh). Incompetence of the first metatarsal leads to plantar subluxation of the proximal phalanx on the metatarsal head, and then to erosion of the dorsal lip of the phalangeal articular surface and spasm of the short flexor muscle.

RADIUM IN THE TREATMENT OF CANCER OF THE PROSTATE. By Maurice Silverstone (Liverpool). A plea is made for use of radium rather than condemning the patient hopelessly to a suprapubic cystostomy. Eleven cases were treated by direct application of radium through a perineal wound. A few showed fairly satisfactory results.

PLETHYSMOGRAPHY OF THE SKIN IN THE INVESTIGATION OF PERIPHERAL VASCULAR DISEASES. By Robert H. Goetz (Cape Town). The principles and details of construction of different types of finger plethysmographs are described. Their clinical use in the investigation of peripheral vascular disease depends on keeping constant the temperature and the heart-output during the experiment, so that the blood content of the capillary bed and of the smaller venules alone alters.

PRECOCIOUS PUBERTY IN A BOY OF ONE YEAR. By Ian Fraser (Belfast). The child was normal till the age of six months and then began to show signs of extreme virilism, with enlargement of the penis, prostate and seminal vesicles, but not of the testicles. There was precocity of bone development and of dentition. At operation a tumour was found of the right adrenal.

CLOSED INTRAPLEURAL PNEUMOLYSIS: AN ARTICULATED HOOK CAUTERY. By R. J. C. Maxwell. The advantages of the cautery described are that it can reach the adhesions near the cannula, and can deal safely with short stout cords and posterior membranous sheets, remaining always at right angles to the adhesion it is dividing, and so keeping the stem out of contact with the lung.

REMNANTS OF THE VITELLINE VASCULAR SYSTEM AS A CAUSE OF INTESTINAL OBSTRUCTION. By J. Scouler Buchanan and Henry Wapshaw (Glasgow). Two cases are recorded of small bowel obstruction: the first was one of acute strangulation by a band containing a persistent vitelline vein; the second, intermittent in type, was caused by a remnant of the vitelline artery. The embryology is discussed and the literature reviewed.

TRANSPLANATION OF THE URETERS INTO THE LARGE BOWEL AND ITS EFFECT UPON THE KIDNEYS. By Clifford Morson and William H. Graham (London). Thirteen patients have been submitted to the operation with five deaths. The preoperative and operative techniques are described. In the eight patients who survived records have been made of the changes in the pyelograms.

POST-OPERATIVE RESULTS OF NEPHRECTOMY. By Howard G. Hanley. The aim was to obtain information about the reserve capacity and compensatory hypertrophy of the remaining kidney. There was 213 case histories available; 182 patients were traced and 100 were clinically examined. The operative mortality was 10·7 per cent. Over a quarter of the patients were dead within two years. Of the cases examined by the Van Slyke urea-clearance test 49 per cent. showed a renal efficiency between 50 per cent. and 75 per cent.; 60 per cent. were below 75; and 11 per cent. below 50. The causes of death are analysed.

HEPARIN IN THROMBOSIS AND EMBOLISM. By Gordon D. W. Murray (Toronto). Animal experiments have shown that heparin is non-toxic, and that operations on blood-vessels can be carried on without clotting after its injection. Administration to over 400 patients has confirmed the non-toxicity. Thrombosis and embolism did not occur in the heparinised patients, and therapeutic value of heparin in cases of pulmonary embolism was striking. The operations of embolectomy and of venous grafting have been successfully carried out under its influence.

This issue also contains appreciations of the late Sir John Lynn-Thomas, the brothers Mayo and of the late Harvey Cushing; and short notes of rare cases.

THE LANCET

LONDON: SATURDAY, FEBRUARY 10, 1940

DIPHTHERIA NOT PREVENTED

Of all failures in our national health policy, the most unforgivable is our inability to bring down the high incidence of diphtheria in children. We have known for years that mere hospitalisation of cases cannot control diphtheria, that healthy carriers abound, and that it is never possible to detect more than a small proportion of the potential sources of infection. We know that natural immunity to diphtheria can be stimulated by artificial means, and that if three-quarters of the child population were so treated diphtheria would disappear from our midst with an annual saving of over 3000 lives in England and Wales alone. All this has been said forcibly and many times, but the progress made has been woefully inadequate. It is difficult to avoid the conclusion that the public fail to seek immunisation principally because they are ignorant of its benefits and that some at least of the blame must be put on a lack of conviction within the medical profession, more particularly among general practitioners. First then we must convince ourselves. And this should not be difficult if we face the accumulated evidence. Much has been said of the earlier disappointments, but any curative measure that saved as many lives as diphtheria prevention has done would be adopted enthusiastically.

The Ministry of Health, in their revised memorandum on diphtheria prophylaxis,[1] have summarised the present position concisely and clearly. Much of what they say is elementary, but it is well to review the essentials on which the case for immunisation is based. Diphtheria is, and has been since the early years of the century, the most common sole cause of death in children of school age. It attacks annually some 60,000 people in England and Wales alone and kills over 3000 of them. As a rule immunity is present at birth, but it wanes after a few months and at the end of the first year most children are susceptible and remain so until they go to school. Thereafter, as a result of clinical or repeated subclinical attacks children gradually acquire sufficient circulating antitoxin to protect them, the requisite amount (not less than 0·01 unit per c.cm.) being demonstrable by a simple intradermal test introduced by Schick over thirty years ago. This natural process is quite haphazard and impossible to control, and while it is proceeding children run the risk of disease, disability and death. In contrast, artificial immunity may be readily induced at any time and under ideal conditions of control, the immunity lasting at least for years and, in many cases, for life. Attacks of diphtheria after immunisation are rare and almost invariably mild. It should be remembered in this connexion that second attacks of true clinical diphtheria also occur. Apart from the advantages of individual protection, which might be expected to appeal most to a parent, it has been shown repeatedly that if 70 per cent. or more of children in a particular community are immunised diphtheria ceases to be a problem in that community. For example, in Toronto the morbidity-rate of diphtheria fell from 164 per 100,000 to 3·5 after the introduction of immunisation; and the annual deaths from diphtheria fell from 65 to nil. Comparable figures cannot be produced from this country simply because mass immunisation has never been achieved, but the extreme rarity of diphtheria among the staff of our fever hospitals bears adequate testimony to the effectiveness of immunisation.

The Ministry's memorandum describes four preparations of toxoid which may be used. A.P.T. (alum-precipitated toxoid) is absorbed slowly over a long period; hence it requires only two injections (the "one shot" method of administering A.P.T. is now completely discredited). The doses of 0·2 c.cm. and 0·5 c.cm. should be separated by an interval of four weeks, the first small dose acting both as an antigen and a detector of sensitive individuals. If there are cogent reasons for so doing, the interval between injections may be reduced to from two to three weeks, but with this, as with all prophylactics, the chance of lasting immunity is distinctly improved by increasing the interval between injections. A.P.T. is a powerful and reliable antigen and the one to be preferred for routine immunisation of children. F.T. (formol-toxoid) is also a powerful antigen but requires three injections at intervals of three or four weeks. T.A.F. (toxoid-antitoxin floccules) is in comparison a rather feeble antigen but is the one least likely to provoke reactions. It has nothing to commend it for routine administration to children, but may be useful for completing immunisation in those found sensitive to the detector dose of A.P.T. It also requires three injections of 1 c.cm., 1 c.cm., and 1·5 c.cm. Probably its greatest use is in immunising adults, who are both more sensitive and more easily immunised than children. T.A.M. (toxoid-antitoxin mixture) possesses no advantage over T.A.F. so far as liability to reactions is concerned and is a less powerful antigen than A.P.T. or F.T. With A.P.T. in the doses recommended immunity has been produced in as many as 99 per cent. of a series of cases. Immunity, however, should never be taken for granted, but should be verified by a Schick test two months after completing the injections. In the small proportion of cases still showing a positive Schick reaction a second immunising course is required. It cannot be said that the injection of toxoid is entirely devoid of risk, but with reasonable care in technique the risk is certainly no greater than that of count-

1. Memorandum on the Production of Artificial Immunity against Diphtheria (revised ed.). H.M. Stationery Office. 1940. Pp. 7. 1d.

less other products given by injection every day. Local and general reactions due to the toxoid itself do occur but they are the exception rather than the rule, and probably no other immunising agent is so easy to handle in this respect. Yet the occasional reactions are said to prejudice the success of an immunisation clinic. If the possibility is frankly admitted, surely few parents would be deterred provided the benefits were fully realised.

THE BLOOD CELLS' FAMILY TREE

ONE of the most vigorous disputes in the realm of pathology during the last forty years has centred round the exact relationships of the blood cells. Now unhappily the fiercest protagonists of the two conflicting faiths are dead. To describe their views as faiths is not inappropriate. Dualists were led by NAEGELI, unitarians by MAXIMOW, and each side denied the validity of the evidence of the other. MAXIMOW constructed a family tree more complicated than any human one based in great part on his belief in the identity of myeloblasts and lymphoblasts. NAEGELI warned the world against so retrograde a view. According to dualist teaching myeloblasts, the primitive parent cells of the marrow, can breed marrow cells only; the lymphoblasts of lymphoid tissue lymphocytes only. The implications of the unitarian view are that parent cells are identical; the nature of the progeny depends on where the parents are and on local physiological or pathological conditions.

The reason why such an apparently simple dispute has remained so long unsettled is technical. It is seldom possible to follow by direct observation successive stages in the development of either type of cell. A large number of devices have been employed to get round this difficulty, but almost all have required the piecing together of isolated observations of different cells. The latest of these is an improved technique for the culture of marrow cells described by ISRAËLS.[1] Starting with marrow containing a majority of granulocytes, lymphocytes or monocytes derived from patients with myeloid, lymphoid or monocytic leukæmia, he determined the nature of the majority of cells after fourteen days in the culture. He concludes that, under the conditions of his experiments, granulocytes, lymphocytes and monocytes follow three distinct lines of development with no intermediate forms. His interpretation of these experiments is rightly limited, for the cells were pathological—an old-standing objection to much of NAEGELI'S work—and the conditions were not made to vary.

The hæmatologist's problem is not so much what these cells usually do as what they are capable of doing. We know that in marrow the hæmocytoblast usually produces marrow cells and that in lymph-glands lymphoblasts usually produce lymphocytes. It is known too that when conditions vary, as they do in disease, lymphocytes may predominate in the marrow and granulocytes in situations where it is hard to account for them, suppuration being excluded. Lymphatic leukæmia is an example of the first, Hodgkin's disease of the second condition. The point that in fact requires study is the experimental variation of conditions of growth and nourishment of the parent cell or cells. Much has already been done, by WERZBERG,[2] LANG,[3] BLOOM [4] and others, to note and seek for stimuli which yield progeny different from the usual ones. It seems that only by varying conditions of life can potentialities be discerned and the identity or divergence of parent cells be discovered. But the time has arrived when improved technique such as the Sandison-Clark method of tissue culture in living animals [5] will probably speedily settle these old disputes.

1. Israëls, M. C. G., *J. Path. Bact.* January, 1940, p. 145.

CHILDREN'S TEETH

THE delay in providing dental treatment for the evacuated school population has come in for a good deal of criticism. In the correspondence columns of the *Times* leading members of the dental profession have blamed bureaucracy in general and the London County Council in particular, and the council has been defended by the chairman of its education committee. The L.C.C. maintains that the responsibility of providing dental treatment lay with the reception authorities, but it does not explain why it did not give some guidance in the early stages to reception authorities, many of whom had little knowledge of how to deal with the problem. It would no doubt have risked an occasional snub, but it would have been able to say that it had done everything possible, and where the reception authority collaborated fully much delay would have been avoided. Before the war the Board of Education had issued a memorandum to local authorities, but this offered little real guidance and had hardly any result. Presumably local authorities took the view that with a war on the school dental service would be called upon for no more than first-aid for the relief of pain. The outbreak of war therefore found reception authorities unprepared to cope with the situation. The British Dental Association, on its own responsibility, sent a circular to every public dental officer and in the columns of the *British Dental Journal* and otherwise urged the Board of Education to advise local authorities what they should do. The Board, after an unfortunate latent period, issued a memorandum which in the main was satisfactory. This has accelerated the transfer of dental officers to reception areas through the agency of the Dental War Committee or by arrangement between the responsible authorities themselves. Since then the services of private practitioners have been made available in sparsely populated areas, and now dental clinics taken over for A.R.P. work are being released for their original purpose; thus slowly the new schemes are being brought into operation. A few authorities showed

2. Werzberg, A., *Virchows Arch.* 1911, **204**, 272.
3. F. J. Lang, *Folia hæmat., Lpz*, 1930–31, **43**, 95.
4. Bloom, W., *Anat. Rec.* 1937, **69**, 99.
5. See *Lancet*, 1939, **2**, 939.

commendable initiative. Manchester transferred its dental staff to reception areas within the first few weeks of war, Preston sent travelling clinics to the schools, and others gave ready assistance to reception authorities. On the other hand, so progressive an authority as Cambridge delayed making dental appointments pending elucidation of the Board's financial proposals.

Some difficulties still remain. Reception authorities have to decide whether to make new appointments now when the evacuated population is flowing homewards but may return overnight if the industrial areas are attacked. Another problem is that most treatment is being carried out without parental consent. It is not always possible to avoid a general anæsthetic in these cases, and it is too much to hope that there will be no accidents. Local authorities can safeguard themselves and their staffs by arranging for evacuation authorities to obtain consent from the parents; this arrangement is already working satisfactorily in several areas. The factor which in the last five months has helped to get things done more than all the memoranda, circulars and minutes has been the child suffering pain for want of effective treatment. Were this sufficiently realised we should soon see the machinery overhauled and central departments coöperating more readily with local authorities. The school dental service has been developing steadily, and if war had not come the increasing interest of the public would have led to the large extension in staff which was necessary. This development should not be held up by the war.

ANNOTATIONS

PRIMUM NON NOCERE

THE value of convulsant therapy, whether Cardiazol, Triazol or electricity is used, is perhaps most striking to those who actually witness the rapid changes it produces in psychotic patients. Hard statistical facts setting out results of treatment alongside spontaneous recoveries are less impressive. But few now deny that at least it hastens a favourable outcome in schizophrenics in whom time would have ultimately produced a cure. The same appears to be true of severe depressive and manic illnesses. Bennett[1] reports the results of cardiazol therapy in 61 cases of depression and 9 of mania. Most of the depressed patients were over the age of forty-five. There was no electrocardiographic evidence that the convulsions produced cardiac damage, even in patients who already had heart disease. Of the depressed patients, 28 obtained a full remission and 32 made a social recovery, while 7 relapsed, though of these 4 improved on a second course of treatment. The results were extremely rapid. Nine-tenths of the severe depressive attacks were terminated after two to three weeks of treatment, averaging 6 to 7 shocks. Therapy was most effective in the depressions of middle and late middle age. Two-thirds of the severe manic attacks were terminated likewise, the average length of treatment being sixteen and a half days, with 4 shocks. Such remarkably satisfactory results would call for universal adoption of the treatment in the affective psychoses were it not for two facts. In the first place, spontaneous recovery is the rule in these psychoses. Nevertheless, a severe depression may last as long as two years—it is perhaps the most unpleasant illness that can fall to the lot of man—and a treatment which will end it in a fortnight must be a godsend to patient and psychiatrist alike. The second fact is the known danger of the treatment. Vertebral and long-bone fractures are not a light price to pay, and elsewhere in this issue Dr. Blair records a case of hemiplegia following therapeutic convulsions.

It is here that Bennett offers the most valuable advice. In his series, vertebral and lower limb fractures were completely eliminated by giving a spinal anæsthetic an hour before the cardiazol was injected. Either 10 mg. of Pontocaine hydrochloride or 100 mg. of Novocain was used. The anæsthetic was dissolved in 4 c.cm. of cerebrospinal fluid obtained by puncture between the first and second lumbar vertebræ. Though spinal anæsthesia is not without its dangers, in the absence of an operation they are minimal. If Bennett's findings are confirmed, the one really serious objection to convulsion therapy will have been removed. Two other useful hints are given by Bennett. For apprehensive patients, if gr. 1/150–1/100 hyoscine an hour before the convulsion fails to relieve the fear, insulin coma may be induced, glucose being given immediately after the convulsion to terminate the coma. Large doses of cardiazol may be avoided by a preliminary intravenous injection of 0·5 c.cm. of liq. adrenaline. At the moment of facial blanching, half the usual dose of cardiazol is injected, and the result is said to be equal to that of the full dose.

1. Bennett, A. E., *Amer. J. med. Sci.* 1939, 198, 695.

CARBOHYDRATES AND STAPHYLOCOCCAL INFECTIONS

IN discussing the relationship between staphylococcal skin infections and diabetes it must be remembered that, since the infection comes from without, virulent cocci must always be present on the skin before a boil can develop, whether the patient is diabetic or not. If therefore diabetics are especially prone to infection, this is presumably due to the fact that their resistance is lowered so that in them the lesion is more serious and the susceptibility to cocci of moderate virulence greater than in normal people. In addition the infection lowers the sugar tolerance still further and a vicious circle is apt to be established. Jackson, Nicholson and Holman[1] have attempted to investigate the precise relationship between carbohydrate metabolism and staphylococcus infection in rabbits. By keeping the animals for some weeks on a diet containing 89 per cent. of carbohydrate (dry weight) their tolerance for glucose was regularly lowered. These rabbits, together with controls, were inoculated intradermally with living staphylococci, and the local lesions and the effect on sugar tolerance were compared in the two series. The influence of intradermal injections of toxin was also tested in a similar way. Unfortunately, however, there seem to have been no preliminary tests for circulating antitoxin in the rabbits which were used. A pre-existing immunity, such as is often present in otherwise normal animals, would certainly, as Downie[2] has shown, account for the localised lesions which developed in the majority of the dieted animals, whereas its absence

1. Jackson, S. H., Nicholson, T. F., and Holman, W. L., *J. Path. Bact.* January, 1940, p. 1.
2. Downie, A. W., *Ibid*, 1937, 44, 573.

would explain the spreading lesions found elsewhere. In spite of this deficiency in the experiment, its results strongly suggest that inability to neutralise toxin had a more disturbing effect on the sugar tolerance in the dieted than in the normal rabbits, and that by analogy efforts should be made to raise the antitoxic immunity of diabetics suffering from boils or carbuncles. It must be remembered, however, that in the rabbit the α-hæmolysin plays a more important part in the infection than in man, in whom the leucocidin is probably a more important factor. Jackson and his colleagues do not indicate the character of the toxin which they used, though α-hæmolysin only seems to have been taken into account. Further work on the same lines would be of real value; and, in view of the susceptibility of diabetics to other forms of infection, the effect of diphtheria toxin and other agents on the sugar tolerance might also be investigated.

BIG HEARTS OF DOUBTFUL ORIGIN

IN this country a suspected fracture of almost any bone, no matter how non-essential to life, is almost automatically X-rayed, but in patients with cardiovascular disease the average clinician still tends to adopt the attitude that radiography is rather a luxury. Fortunately, largely because of the pioneer work of Parkinson, Laubry, and Roesler, this attitude is slowly being modified, and Willius [1] has lately drawn attention to the value of radiography in the elucidation of obscure cardiac enlargement. There is general agreement that the most reliable radiological guide to the size of the heart is the ratio of its maximal transverse diameter to the internal diameter of the thorax, a ratio which in health should not exceed 1 : 2. It is essential to make allowances for the short stout people whose relatively high diaphragm causes the heart to lie more transversely than usual and thus on superficial examination to appear enlarged, but this appearance can often be corrected by examining the chest during full inspiration. Another point which is often overlooked is the displacement of the apex beat to the left by scoliosis.

In spite of an accurate history and a full clinical and radiological examination there will still be an occasional case in which no cause for cardiac enlargement can be found. The first step is then to decide which part of the heart is enlarged. Should this be the left ventricle the question arises whether the patient has had hypertension and a coronary thrombosis has brought the blood-pressure down to normal limits. Among the other conditions which must be considered are atypical forms of pericarditis, aortic stenosis with only slight degrees of obstruction, congenital lesions, particularly ventricular septal defects, cor pulmonale, tumours of the heart and the enlarged heart of glycogen disease. Re-examination after an interval may help. The main point, however, that these cases bring out is that no examination of a patient with doubtful heart disease can be considered complete without a full radiological examination.

A GODFATHER OF THE MICROSCOPE

Ernst Abbe, to whom more than any other man the world is indebted for the development of the modern microscope, was born just a century ago, on Jan. 23, 1840. It is refreshing to acknowledge at this time that he gave all his lifetime to the advancement of science in its highest sense, and that personal ambition or narrow nationalism was foreign to his very nature. He was of comparatively humble origin, but showed such ability that he was sent to the universities of Göttingen and Jena, and at the age of twenty-three was appointed lecturer on mathematics and physics to the University of Jena, a connexion that was to continue to the end of his life. Three years later he became associated with the firm of Carl Zeiss as optical adviser, an association that proved to be of outstanding importance in the development of optics. Within a few years Abbe transformed the methods of manufacture, particularly of microscope objectives, so that the firm of Zeiss from a position of comparative obscurity became foremost in the construction of microscopes. This was achieved by the introduction by Abbe of improved methods of production, founded on a study of the formation of optical images from the standpoint of geometrical and physical optics. He discarded the old trial-and-error methods and relied on a reasoned combination of theory and practice. Abbe's work on the theory of the microscope was no doubt founded in its essentials on that of Fresnel, but it led him to realise that the production of optical glass of relatively different refractive index and dispersive power was essential. Experimental work begun by Dr. Otto Schott in 1881 was at Abbe's suggestion removed to Jena the next year. In 1884 the manufacture was placed on a commercial basis subsidised by the government, and a year later Abbe introduced apochromatic objectives and compensating oculars which today are still recognised as the best combination available for visual microscopy. Abbe at this period was in close touch with the Royal Microscopical Society of London, of which he had been made an honorary fellow in 1878. The journal of the society, in which no less than nine original papers by him are published, provides much information of interest. Thus it was the communication with Mr. J. Ware Stephenson that resulted in the computation by Abbe of the homogeneous immersion objective, without which most modern bacteriological work would be impossible.

INHERITANCE OF AN ACQUIRED CHARACTERISTIC?

FROM a series of experiments with a breed of rat very susceptible to Jensen's rat sarcoma S. Russ and G. M. Scott, of the Barnato Joel laboratories at the Middlesex Hospital, report some curious observations.[1] Initially rats were inoculated with a piece of tumour in such a way that the tumour did not progress but, by becoming absorbed, rendered the animal immune to any further inoculations of the same sarcoma. Immune males and females of this type were then mated and the resistance of their offspring tested. In 185 such offspring the volume of the tumour, after 17–21 days' growth, was on the average 30 c.cm., and in 72 of the animals, or 39 per cent., it eventually disappeared. In an equal number of control rats, carefully paired, the average volume was 51 c.cm., or nearly twice as large, and the tumour disappeared in only 11 per cent. This increase in the resistant powers of the young of the immunised rats might, of course, be only a passive immunity transmitted by the female. Male immune rats were therefore mated to normal females. Of the 41 offspring 13, or 32 per cent., had disappearing tumours and the average volume at 17–21 days was 28 c.cm. In the corresponding control rats the disappearance rate was only 7 per cent. and the average volume 43 c.cm. The powers of resistance of the former group were therefore not appreciably altered by the substitution of a normal for an immunised mother. The male alone was capable of transferring some immunity. In a

1. Willis, F. A., *Proc. Mayo Clin.* 1939, **14**, 814.

1. *Proc. roy. Soc.* Series B. 1939, **128**, 126.

third experiment the offspring of normal rats were tested, the parents were then immunised, remated, and their second litters tested. The offspring born before their parents were immunised were of normal susceptibility; of those born afterwards the average tumour volume was only half that of those born before and the tumour disappeared in 43 per cent. against 8 per cent. in the controls—again evidence of a substantially enhanced resistance. It was clearly of interest to see whether this increased resistance is transmitted to a further generation. A preliminary experiment shows that it is. Six litters, the offspring of untreated parents but the grandchildren of immunised rats, were inoculated at the same time as their control cousins which had untreated grandparents as well as parents. In the former the average tumour volume was still less than half that in the latter. There thus appears to be no falling off from the amount of resistance transmitted to the first generation.

A STATE EXPERIMENT IN CHEMICAL RESEARCH

Sir Gilbert Morgan, F.R.S., died on Feb, 2 at Richmond. Essentially a research chemist, much of his work was of significance to the general community. As he often acknowledged, he owed a great deal to his early career at the Royal College of Science at South Kensington, the teaching at which some 40 years ago was still under the influence of the Huxley tradition and has probably never been surpassed for thoroughness and insight. These qualities Morgan himself possessed to the full and retained throughout a long working life. In 1925 he was appointed first director of chemical research at Teddington under the auspices of the Department of Scientific and Industrial Research. The position was much to his taste, giving scope to his genius for coördinating chemistry and engineering, notably in connexion with high-pressure and high-temperature chemical reactions. He developed many synthetic processes, some of which are likely to find wide application, his most familiar researches being on high-pressure catalytic synthesis, tars, and synthetic resins. At the laboratory he collected and inspired a large team of workers by whom he was much liked and respected. His was a strong and attractive personality with an element of reserve. His opinions were discerning and to the point, and he had the agreeable qualities which came from his partly Welsh descent. His love of books led him to accumulate a scientific library of which he was justly proud. His lifetime of work has set its mark on British chemical industry.

PRELUDES TO ANÆSTHESIA

PREMEDICATION, other than basal narcosis, was discussed in all its aspects by the section of anæsthetics at the Royal Society of Medicine on Feb. 2. There seemed to be general agreement that premedication is almost always desirable, but there were sharp differences of opinion with regard to children. One speaker declared that it should never be used for children. The one method to get a child safely under an anæsthetic without terrifying it is, he said, to do everything before the child's eyes and have everyone concerned also in front of him. Other speakers seemed to dread an inevitable psychic damage, the effects of which might last for life, if any child was submitted to an anæsthetic without previous premedication. It seemed clear that the speakers paid too little regard to children's individualities. No all-comprehensive routine should be laid down for children any more than for adults. The former quite as much as the latter show mental and physical differences which must be taken into account for each patient if the best method is to be adopted on every occasion. There are "good" children who, handled with tact, can be submitted to an anæsthetic without receiving any psychic harm. There are others for whom a physical struggle and a mental upset are inevitable unless their sensibilities are dulled beforehand. The barbiturates, of course, came in for much mention and several recommendations were made for the treatment of overdose or serious symptoms due to idiosyncrasy. Picrotoxin was praised if given intravenously and other speakers advocated the use of glucose and atropine. Several speakers feared the effect of barbiturates on asthmatic subjects. Generally speaking, Omnopon and scopolamine seemed to be the most approved drugs for premedication, atropine also being highly valued except when anæsthesia was to be maintained by gas and oxygen only.

CARCINOMA OF THE CERVICAL STUMP

SUBTOTAL hysterectomy is a comparatively simple operation and has for many years been accepted as adequate in the treatment of benign pathological conditions in the uterus. Fricke,[1] however, has found that among 1676 cases of carcinoma of the cervix treated with radium at the Mayo Clinic between 1915 and 1930 there were 108 cases of carcinoma of cervical stump, a figure which coincides with the experience in many other clinics and suggests that cancer is more likely to develop after subtotal hysterectomy than in the normal cervix. If this is so it seems to justify the slightly increased risk of total hysterectomy for all cases of benign tumours and at least demonstrates that every uterus removed above the cervix should at once be examined for macroscopic signs of malignant growth and passed to the pathologist for complete examination. The need for this is supported by the number of cases of coincident carcinoma which are now on record. The importance of differentiating between coincident carcinoma existing at the time of operation and true primary carcinoma of the cervical stump was pointed out by Nuttall and Todd,[2] and by Sharples, and Fricke has used the criteria of the former that two years or more should have elapsed between subtotal hysterectomy and the diagnosis of carcinoma of the stump for the lesion to be a genuine one. Of 99 cases investigated by Fricke, 57 may be regarded as genuine; 42 were coincidental and were either squamous carcinoma in the cervix or adenocarcinoma from a primary which must have been present in the removed corpus. Of the true stump carcinomas, all of which were treated by combined radium and X-ray therapy, 20 per cent. were in stage 2, 80 per cent. in stages 3 and 4, and 23·3 per cent. of all stages survived five years. Coincident cancer cannot really be staged, but of 42 cases 79 per cent. were regarded as being in stages 3 and 4. Of these, 21·4 per cent. lived five years, but half the total cases died within a year of treatment. This figure suggests that most of the survivors were probably true stump carcinomas, because Nuttall and Todd showed conclusively that the prognosis in coincident cases is very bad. Of the 18 coincident cases, 13 were known to be dead, 10 within a year, and no patient was known to have survived longer than three years. The conclusion drawn is that whenever subtotal hysterectomy is performed careful examination of the cervix should be done, and that the patient should have a pelvic examination at stated intervals. This recommendation should be strengthened. Subtotal

1. Fricke, R. E., *Proc. Mayo Clin.* 1939, **14**, 705.
2. Nuttall, J. R., and Todd, T. F., *J. Obstet. Gynæc.* 1935, **42**, 860.

hysterectomy should never be undertaken without a preliminary examination in the lithotomy position when a small curette can be passed to obtain material for examination. If this does not appear malignant, and the clinical appearance of the cervix is healthy, the subtotal operation may be carried out at once. In cases of doubt the pathologist's opinion must be awaited. But if complete hysterectomy can easily be performed it should always be the operation of choice.

THE PRESCRIPTION OF ASPIRIN

IT is not uncommon for practitioners to prescribe aspirin in a suspension of mucilage and tincture of orange in preference to the more general tablet form. There has always been some little doubt whether patients should leave the bottle on the shelf indefinitely and expect the same results as are obtained from the freshly dispensed mixture. Tomski and Waller (*Pharmaceut. J.* Jan. 27, 1940, p. 53) show that these doubts are not without foundation. They find that if acetylsalicylic acid (3 per cent.) is dissolved in 50 per cent. alcohol and kept under ordinary laboratory conditions it decomposes at the rate of about 1·5 per cent. in a day, 6·0 to 6·5 per cent. in a week and 13·5 to 14·5 per cent. in a month, liberating salicylic acid which is a gastric irritant. They also find that a suspension of the same strength kept under the same conditions loses 0·3 per cent. in a day, 1·6 to 2·0 per cent. in a week and 7·0 to 8·0 per cent. in a month. Their conclusion is that suspensions should be prescribed in preference to solutions in alcohol. The following prescription is a useful one.

℞ Acid. acetylsalicyl. gr. 80
Pulv. trag. co. gr. 40
Syr. limonis ℥i
Aq. chlorof. ad ℥viii
Sig. ℥ʃs S.O.S.

This mixture will keep fairly well, but should be made up freshly if it is to give its maximum effect and be as little irritating as possible. Syrup of lemon is suggested because of the temporary scarcity of orange peel for the manufacture of orange preparations which, by the way, the Minister of Supply has included under "non-essential medicines." On the question of solutions of aspirin prepared with ammonium acetate or potassium citrate Tomski and Waller point out that the loss due to decomposition has long been established; thus the Natural Formulary recipe for "mist. acid. acetylsal" is not to be commended.

MARGARINE

THE battle of the margarines seems to have been won, at any rate for the duration of the war. Dietitians have long urged the Government to compel manufacturers to make their margarines the equivalent of summer butter in vitamins A and D. Scandinavian countries took that step long ago and the decision of the Ministry of Food at the outbreak of this war to vitaminise the margarine pool was hailed with satisfaction. Many weird explanations were given for the Ministry's later fall from grace. It was the poor people who need vitamins A and D most who were tempted to buy the cheap unvitaminised margarines, though the vitaminised could be purchased for as little as 5*d*. per lb. The biggest working-class wholesale manufacturing company had for long vitaminised all its margarines to protect its customers against deficiency, and it was felt that the least the Government could do was similarly to protect the poor people who went to other shops. Fortunately the Ministry has reconsidered its reactionary attitude and from now on all margarines are to be vitaminised. There is no reason why such an excellent war-time measure should not be continued when peace returns.

Margarine still has to fight the prejudices of the old-fashioned. Since its first manufacture in England in 1889 the industry has made amazing strides. Instead of beef olein, hardened nut and whale oils are now used, and the texture, consistency and melting-point, though not the chemical composition, of butter can be closely imitated. The flavour of butter is introduced by using the same microbes which produce the aromas of the best English butter to curdle the skimmed milk with which the fats are emulsified. Margarine may still not be quite so digestible as butter and may be innocent of butyric acid, but none the less it is an extremely valuable food. One place where it has unexpectedly won for itself a permanent niche is in the making of pastry. Whereas Mrs. Beeton says take so much butter and so much lard, the modern domestic science expert says "lard and margarine." It makes a better and more open-textured pastry than butter and many a die-hard who refuses to allow margarine on his table must have eaten it in his pastry unawares. Now that we can count on its vitamin content margarine can claim to be in almost all respects a complete substitute for butter at a third or half the price.

TEN YEARS MATRON-IN-CHIEF TO THE L.C.C.

IN October, 1929, the London County Council, then about to take over the public hospitals of London, appointed Miss Dorothy Bannon as their first matron-in-chief. She was faced with a difficult task. The nursing staff transferred with the 76 hospitals numbered 10,000 and as they had been employed by 26 separate authorities each with its own conditions of service, the work of welding the nursing service into a coherent whole demanded qualities of a very high order. Miss Bannon possessed those qualities. She had high ideals, great organising ability and the necessary driving power to get her ideals put into practice. She knew precisely what she wanted—increased pay, reduced hours, better training, improved amenities in nurses' homes and relaxation of restrictions in off-duty time—and she got it all. No detail was too small for her personal attention; she looked into the training of male nurses, and she was in charge of the school nursing service and the female domestic staff of the hospitals. The total staff under her control numbered 20,000, of whom 13,000 were nurses, assistant nurses or probationers. In this stupendous task she wore herself out.

". . . . In some Faculties the tale of lectures is comparatively small, yet students of these Faculties are not exceptionally conspicuous in Guild life. This gives weight to the arguments of those professors who claim that a lightening of the teaching load, while it would endanger standards, would not have a proportionate effect either in increasing private reading or in revitalising undergraduate life."—Mr. R. E. PRIESTLEY, D.Sc., vice-chancellor and principal of the University of Birmingham, in his annual report to the court of governors.

INDEX TO "THE LANCET," VOL. II, 1939

The Index and title-page to Vol. II, 1939, which was completed with the issue of Dec. 30, is now ready. A copy will be sent gratis to subscribers on receipt of a post card addressed to the Manager of THE LANCET, 7, Adam Street, Adelphi, W.C.2. Subscribers who have not already indicated their desire to receive indexes regularly as published should do so now.

THE PROBLEM OF ADOLESCENCE

The Morison lectures delivered at the Royal College of Physicians, Edinburgh, on June 8 and 9, 1939, by HENRY YELLOWLEES, M.D., F.R.C.P., *physician for mental diseases to St. Thomas's Hospital*

II

THE second hall-mark of adolescence is a more significant and important one. It is the Questioning of Authority. To use the words of the old story: "Yea, hath God said, Ye shall not eat of every tree of the garden?" For the first time someone had ventured, not to defy, but merely to question, the authority of the benevolent despot who ruled the garden. Have any of us difficulty in recalling occasions when, though not in a position to make any effective protest, we were conscious of a very real and restless questioning of authority, usually—though by no means necessarily—parental authority? "I know I am young," we felt, or said, "and no doubt my opinions are crude, and my judgment immature, but how am I to develop my judgment if I never exercise it? After all, it is *my* life, and all I ask for is simply a vote, not control, merely the right to be heard in matters that concern me, the chance of giving an opinion. Am I to be spoon-fed all my life? Am I never to think for myself? Is a thing true, for me, just because my mother says it? Is father always right, just because he is my father?" Those who cannot recall such feelings either are to be congratulated on very remarkable parents and upbringing, or else are psychological children still.

The third sign of adolescence is probably the most important and striking of all: the Realisation of Sex. "The eyes of them both were opened," says the story, "and they knew that they were naked." Up to that time they had been completely un-sex-conscious, and then there burst upon them that revelation of mutual interest and desire and impulse, of confusion and delight and shame, which we call the realisation of sex. At the moment I shall simply say that this sign, this feature, of normal adolescence stands alone in its importance. It does not require Freud to bring home the truth of that to anyone who has the ability to think honestly, and the courage to apply his honest thinking to his experience.

Lastly, of course, after the desire for knowledge, the questioning of authority, and the realisation of sex, comes the great *need* of adolescence: the Realisation of the Need for Work. "In the sweat of thy face shalt thou eat bread." That phrase, by the way, is regarded as part of a punishment and curse by some whose inner vision must be strangely astigmatic. I cannot imagine that there are any of you who have not yet had occasion to be humbly and heartily thankful that at least there is always one's work. If there are, you will come to it soon enough, and will learn with the rest of us that, in the last resort, work can keep us sane when all else has failed, is capable of seeing us through loss of partner or child or home or friend or happiness, and can give us peace in our time of sorest need.

These four "cardinal signs," as we may call them, of healthy adolescence—there are many others—vary within wide limits as regards the time at which, and the order in which, they become recognisable. You observe that they are in close harmony with the conception of adjustment of outlook on occupational, social, and sexual situations to which I referred earlier; but, as I have now put them, they are easier to study in more detail at an earlier stage, and particularly in relation to the factors which hinder their appearance, or influence their expression.

It is clear that from one point of view, a child's, there is much to be said in favour of existence (it is not life) in the garden. Complete ignorance (or if you prefer to misuse a beautiful word and call it innocence, by all means do so), no responsibility, everything arranged by a very benevolent Authority, none of the upsets and embarrassments of sex, everything wonderfully "pure" (another beautiful word ruined)—above all, no work. Everything in the garden is indeed lovely; in fact, it is all so dazzlingly white that the inhabitants tend to suffer from snow blindness.

Sooner or later, however, the child must leave the garden and face the road which winds uphill to the very end. What is going to happen when the gates close behind him, as they must inevitably do, if those in authority—instead of teaching him to look upon the garden as the gateway to a wide and a full and a friendly world—have led him to regard it, not as a preparation, but as an end in itself? If, through ignorance or selfishness or folly or worse, they have led him to look on it as a prison, or an almshouse, or a shelter from a cold and cruel world, or a kind of mutual admiration society, or an emotional hothouse, what will happen when poor Alpha, pitifully unprepared and weighed down by the old ignorance and idleness and submission, meets the first inequality of the long rough road? He will treat the experience as a painful and personal grievance, and he will very naturally attempt to get back to the garden. "Truly, if they had been mindful of that place whence they came out, they might have had opportunity to have returned." That is the position in a nutshell. Alpha is moving inevitably further and further away from the garden in time and in development of body and brain, but he is ever mindful of the place whence he came out, and looks regretfully backward, constantly seeking opportunity to return to the only situation with which he was ever able to cope. There is his treasure, and there must his heart be also. His outlook, that is to say, is not an outlook at all, but a series of backward glances so constantly repeated that his gaze becomes directed and fixed the wrong way. He is moving in the right direction because he cannot help it, but he is walking backwards. In actual time and appearance he is passing into adult life; psychologically he is eternally and essentially a child; clinically he is a neurotic.

Now, although reluctance to leave the garden—followed, of course, by a desire to return to it—is a childish attitude, it is not one which the normal child will adopt of its own accord. The psychological stirrings and strivings of adolescence will make their appearance in due course just as quietly and inevitably and irresistibly as will the bodily changes of that period, provided the child has not been interfered with. No, I do not say that guidance and control are not desirable, and indeed essential, and may not be effective and valuable—I am very far, indeed, from saying it—but I do say that only interference can upset the psychology of adolescence in a normal child. I say further that interference *will* upset it with astonishing ease, and that interference is almost impossible to avoid. It is a sobering reflec-

tion that the hero and heroine of our parable, who achieved adolescence so successfully, had no parents at all—not even an uncle, wicked or benevolent. There is the cat out of the bag at last, in the form of the painfully obvious truth that conduct on the road depends on what has happened in the garden, and what happens in the garden depends on the policy of the management. I need hardly say that the management always acts with the very best intentions, but unfortunately it is the road to complete manhood and not the road to hell that we are anxious to pave. Let me give you a few homely everyday illustrations of the good intentions of the management and their results.

One of the things that we do really know about children is that they are highly suggestible. You have only to tell your child often enough that he is naughty, beginning to do so early enough, and he will accept your view and be naughty to oblige you. Fortunately this works both ways, though few parents realise the fact. There is only one way to help a child to acquire some particular virtue, namely to give him credit for possessing that virtue, whether he deserves it or not. How maddening it must be for a child to hear that stupidest of all parental pronouncements, "You must show yourself trustworthy before we can trust you." What a pity it is that the child is rarely in a position to give the only possible answer, "How the mischief can I show myself trustworthy until you trust me?" It is unfortunate, no doubt, that the child does not reason in the same way as its parents, but it doesn't help matters to ignore the fact. "Why on earth do you sit moping indoors on this lovely day?" says mother to John, aged sixteen. "Why can't you come out and mix with the others now you're such a big handsome boy? Do come and talk to the Smiths—such nice girls!" What is John to reply to this sample of how not to do it, even assuming that he is able to ignore mother's tone, which registers a nice mixture of annoyance and despair? He will ask to be left alone, and will perhaps try, rather pathetically, to explain that he'll do things all right if he's not made to do them. To which mother will reply, very truthfully, that she can't understand him. She may tell John later on that he is self-willed—what a label! Here the matter drops, the gulf of mutual misunderstanding having been widened just a little further, because John is probably not in a position to discuss "self will" with her, or refer her to that gem of Shakespearian psychology where Julius Cæsar, after announcing, "The cause is in my will: I will not come," proceeds to demonstrate that will has nothing to do with it. "Oh yes," said a patient's father to me recently, in the presence of the patient—a frightened lad of fourteen or fifteen—"George is very truthful. He knows he'd get a damned good hiding if he wasn't." He then added, in his pleasantly robust fashion: "And I've had no trouble about this sex business. I just told him to leave himself alone or he would end up in a lunatic asylum, and there's not been a sign of it."

The children have been playing in the drawing-room, and a valuable vase is on the floor in fragments. Mother, being quite unable to get past the fact that she had forbidden them to enter the drawing-room at all, has warned them that father will be informed on his return, and will be very angry when he learns how *she* has been disobeyed. Father is a just man, though perhaps lacking in imagination, and in a short grave lecture he states, firstly that he is not angry—oh no, he is not angry at all; secondly that it is very wrong to disobey mother; and thirdly that it is very wicked to break an expensive vase. He then points out that a lie is a sin in the sight of God, and, singling out little Willie, announces once more in tones like the last trump that he is not angry, but that he must and will have the truth. "Who broke that vase?" Regarding this domestic tragedy I will only say that if, with the amazing ingenuity of a frightened child, little Willie can by any manner of means lie himself out of the difficulty he will do so, and I for one don't blame him—as Yum Yum said! But believe it or not, if father had made the best of the false position in which mother—forgive me—had put him, by cutting out his lecture, expressing his delight that little Willie, well-known as the most truthful boy in the county, was present, and called upon the others to listen to Willie doing his stuff, Willie would have died rather than depart one inch from the truth as he saw it. Yes, Madam, the man has children of his own!

These are simple everyday illustrations of how easy it is to check the development of attitude in which psychological salvation lies. I could, of course, illustrate almost indefinitely. Do you realise how impossible a satisfactory development into adolescence is for a child who has been so spoiled, discouraged, or dominated that he tries blindly to rush back into the garden and slam the gate at the first breath of contact with the big real world. How is a child ever to acquire a sense of responsibility if his parents have failed to see that you cannot have a sense of responsibility without independence? They expect the one from him, but they fail to give him the other. What is the use of repeating that inane question, so beloved by schoolmasters, as well as by others who ought to know better, "Why don't you think?" to a child who has never for one hour been allowed to think or judge or decide in any single department of life? His clothes, his food, his walks, his friends, his amusements, his duties, his comings and goings, and everything that pertains to him, have been chosen and decided for him by the benevolent despots of the garden, and yet the wonder of it all is that up to the very last, right up to the time when the child becomes the nervous wreck that we make him, he is ready to forgive us for saying to him, "Why don't you think?"

Let us consider the sphere in which fatal mistakes are made more commonly than in any other, for reasons into which I only wish we had time to go. Unless a child is mentally deficient, he will ask by the time he is three years old such questions as where he came from, and why he is made differently from his small sister. He will accept what he is told on such subjects just as naturally as he will accept the answer he is given to any other question, but there is a difference. He is impelled towards these questions by just about the strongest instinct in his nature. Once he finds he has been misinformed, or once he senses, as he does with uncanny quickness, that there is a conspiracy of silence on the matter, he will certainly cease to trouble, he will not ask again, but he will continue his investigations, experiments and imaginations without consulting you. All you have done by making sexual questions a mystery is simply to add fuel to the flame of his interest. All children love a mystery. A little later on the parents may find it necessary, when they discover that the child is still interested, in spite of their dignified reserve, to point out that it is all rather naughty. There are few children who would not go through fire and water to investigate a naughty mystery, even if they were not impelled towards it by their deepest instincts. Finally, as it were in despair, the parents play their

last card and call in the aid of magic. I am rather sorry for the parents, because, unless you have begun early enough, it is a pretty big mouthful to sit down and explain to a small boy in words of one syllable that it is your job to help him to sublimate his sexual instincts into socially desirable channels. It was easier to say, "Stop that, or father will be angry!" And now that has failed, so there is but one thing left: "Stop that or God will be angry!" And the child is left with an idea of God as someone very kind and very loving, no doubt, but always on the side of the grown-ups, and with a terrible down on sexual curiosity.

I may add here that I could easily have devoted these lectures entirely to the sex education of children. In fact, I very nearly did. I am anxious, however, to make a more comprehensive survey of our problem; so I must pass on with perhaps the final statement of the point that the association of sex and sin was one of the few really bad legacies left to us by our Victorian grandparents—or was it parents?—and I am inclined to rank it as probably the commonest factor, and certainly one of the most important, in adolescent difficulties.

Let me put in general terms what I believe to be an unchanging and invariable law. There has always been and will always be but one fundamental and essential answer from the child to the parental, "Thou shalt not." That answer is: "Shan't I? I shall have a remarkably good try, and you won't know." I don't say that the answer is spoken, or even consciously felt, but it is the answer that is ultimately expressed in conduct and character. It may be impossible to prevent the child from doing something that you do not wish him to do, but there is one way, and one way only, that offers a real chance of success: make sure that he knows all the relevant facts, and let him understand that he is free to choose for himself. I should like to forestall criticism here by pointing out that this line must be begun early enough, and followed consistently enough, if it is to succeed. It *does* succeed in those circumstances, but it is no use attempting it as a counsel of despair when the mischief has been done, and expecting it to work like a charm. A large proportion of parents who bring their children to me give me the flattering information that they have come to me as a last resort, and then proceed to put that most pathetic and futile of all queries, "What am I to *do*, Doctor?" There is but one answer: "Madam, it is not a question of what you should do, it is a question of what you and the atmosphere of your home *should have been*." It is our earliest experiences in our own homes and lives which determine with a terrible certainty our fundamental and almost unchangeable feelings, expressed later in opinions and conduct, about what is really meant by such words as mother, God, home, love, duty, obedience, friendship, authority, Monday morning breakfast, worship, honour, and indeed the entire world within and around us. When Jesus of Nazareth talked of God as a Father, he used the word most likely to convey a picture of what he was trying to express to the greatest number of his hearers, but the word by no means conveys the desired picture to everybody. A patient once said with great bitterness, but quite understandably: "If God is like my father, then religion can go to Hell."

"We bake scones like mother used to bake," says the familiar advertisement, and the unsuspecting man falls for it, and purchases these scones, as the inevitable result of mother's scones having been forced down his unresisting gullet in unending procession, and without competition, in the days of his childhood. Inevitably, and often in the face of wider experience acquired too late, they become the standard by which all other scones are judged—to their profound disadvantage. There is only one exception to the rule—they may possibly become the other extreme, namely scones which must be avoided at all costs, to which any conceivable form of nourishment, begged, borrowed or stolen, is preferable. The word "rice pudding" occurs to me here. The point is that development of outlook can only occur on the material supplied, and if all opportunity and possibility of adult outlook, and even knowledge that such a thing exists, have been hidden from the child's eyes from the beginning, no amount of information and instruction when it is too late will suffice to alter the essentially infantile nature of his reactions.

Will you consider for a moment the young woman, let us say, who has failed to acquire a grown-up outlook during the period of adolescence. She is, in due course, launched into apparent adult life, and a bewildering variety of *real* things—occupational, social, and sexual situations for which she is utterly unprepared in attitude—is thrust upon her. Things, for example, like living in a club or a camp or a hostel, getting engaged, getting married, physical sex, renting a flat, having a baby, running a house, engaging a cook—worse still, dismissing a cook—and so on. Faced with these things, she will react in one way only—the one way with which she is familiar, the only way she knows, the way that mother used to do. That is why neurosis, which is psychological inadequacy, is handed on from generation to generation; not through any mysterious hereditary factor, but simply because the unprepared individual reacts to life in the way that he or she came to regard in childhood as the only way possible, and so inevitably reproduces in the new circumstances the essence of the old situation. It is all very obvious really. We cannot doubt that what we are taught in the classroom has some influence on our performance at the degree examination. We cannot fairly blame the cake for coming out of the oven half-baked. I may add, while on this subject of cookery, that it is almost impossible to convince the parents that the cake should have any say in the matter, still less that the oven can be in any way responsible for poor results. They will agree that too many cooks spoil the broth, but cake is quite different. "Bake me a cake," they say (and teach their lisping infants to say), "as fast as you can." That is the main thing, but that is not all; "Pat it, and prick it, and mark it with T." I can understand the patting, and forgive the pricking, but why the crowning infamy of branding the thing like a slave? "And put in the oven for Tommy and me." Quite so, to show that it is Tommy's cake and mine, really. Which, being interpreted, meaneth: "You must grow up into a fine man just like father, so that we can both feel proud of you." And note that all this messing about with the unfortunate cake occurs from the very beginning. If, on emerging from the oven, with Tommy's sign-manual burnt into it, it were plaintively to assert that it wasn't anybody's cake, but just a cake, with a right to independent existence—or, shall I say, self-determination—nobody would believe it, least of all Tommy and me.

Lest you should think me fanciful, here is the Tommy motif in modern everyday life. I quote from the Births Column in the *Times* of a few weeks ago, but, in mercy, I have altered the names.

"SMITH.—On May 1, 1939, at 25, High Street, S.W., to Millicent, wife of A. B. Smith,—a sister for Percy and George."

You will notice that the unfortunate infant whom this spirited sketch of Mrs. Smith and her belongings is supposed to concern (though not one word in it refers directly to her as an individual) has got her career settled for her all right. Apparently she is to exist (*a*) for the greater glory of Millicent, the wife of A. B. Smith, and (*b*) for the help, comfort, and encouragement of Percy and George. Excellent objects in their way, no doubt, but suppose they don't commend themselves to the sister of Percy and George? Well, the responsibility will surely rest with Millicent, the wife of A. B. Smith, who has not only marked the cake with M, P, and G, but is well on the way to turning her oven into a refrigerator—with her monogram on the top. Thus happy families are made.

We cannot, I fear, attack the question of why so many parents show this intense craving to keep their children in an infantile attitude. We should probably have to go back to *their* adolescence for the answer. We have credited them with the best intentions, and we must leave it at that. Let me give you, however, one final picture of the process. Imagine a rubber ball whose function is to roll about the floor and amuse those who are playing with it there, and let us say that you have taken upon yourself to organise this ball's activities. Down comes your hand upon it, and we can conceive one of two things happening. First, you may come down so crudely on the ball that you convert it into a pancake and ruin its functional activity. Second, you can imagine, for the purpose of our analogy, that the rubber ball—it is quite a little ball, you know—slips between your fingers and flies up to the roof, in a way that rubber balls have, with a force corresponding to that which you exercised in your attempt to control it. Adolescents react in either of these ways, and sometimes in both of them in rapid succession, oscillating frenziedly between a futile submission and an equally futile rebellion. The submissive eats mother's scones, and honestly believes that his independent unaided judgment has prompted him to choose them from all others. The rebel flings mother's rice pudding into the gutter, and calls that independence.

I have tried to establish, as fully as our time allows, that the cardinal signs of adolescence may be checked and hindered in their appearance by the home atmosphere during childhood, and that, when adolescence comes, the child may be not only unprepared to leave the Garden of Eden, but may have been largely robbed of the natural desire to do so. The child is, as it were, psychologically torn in two, because the despots of the garden know their business and have, from the best motives, seen to it that childish things are made terribly hard to renounce. A vast number of novels, ancient and modern, show this with varying degrees of insight, and of course the classic and world-famous study of it—in which, by the way, the garden wins—is the play, Peter Pan. In real life this situation leads on to a host of disturbances of mind and body, some of which I have already outlined, and to piteous family situations which can only be called psychological tragedies. They ruin the peace of many a home, they break the heart of many a parent, and they wreck the character and overshadow the destiny of countless young men and women.

At this stage we sometimes think of calling in the Doctor, so I shall take leave here of the young person Alpha for the present, and discuss him further tomorrow in relation to the medical profession.

PUBLIC HEALTH

BACILLARY DYSENTERY IN AN EMERGENCY HOSPITAL

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The institution in which the epidemic occurred had for many years served as a poor-house with accommodation for 700 inmates. Earlier in the year the building had been inspected with a view to its use in war-time as an evacuation hospital of 600 beds. No changes were proposed. The building, good but old-fashioned, was mainly three-storied, a third being two-storied. There were no lifts, and the sanitary arrangements, sufficient for normal use in a poor-house, were inadequate for a hospital. The entire institution, apart from a sick-bay of 40 beds, was devoted to housing able-bodied inmates. Sleeping accommodation was provided in dormitories of 10–25 beds, and there were central dining-rooms and sitting-rooms, separate for men and women. The inmates worked in the kitchen, food stores, pantry, and laundry, cleaned the dormitories and sitting-rooms, and acted as porters, but the senior posts were filled by paid officials. The inmates were supervised by male and female attendants with no certificated nursing experience. A medical officer was in residence, and temporary disablement was treated in the sick-bay under trained nursing care, the more serious cases being transferred to hospital. The water-supply was interesting. At the highest point in the institution a central tank was supplied from the main pipe. This tank supplied a number of secondary tanks throughout the building, each of which supplied a limited area. Dysentery was not unknown in the institution, although no previous epidemic had occurred. Of significance, however, was the history of diarrhœa from time to time affecting groups of inmates before it stopped.

The end of August, 1939, brought an instruction to the local authority to adapt the institution for use as a casualty clearing hospital of 600 beds. On the 31st, when there were 549 inmates resident, it was decided to admit patients evacuated from other hospitals in the area; 197 were admitted, with varied acute or chronic illnesses in need of further hospital care. To balance this influx 60 inmates were discharged and the remainder crowded together. This acute congestion was relieved within three days, when, after transfers, only 250 inmates remained, although the hospital had grown to 239 patients. Two separate communities, each with its own medical supervision, were then in residence. The necessary medical and nursing staff for the hospital were recruited from neighbouring hospitals and other institutions. As many nurses as possible were accommodated in a nearby hospital, and the remainder travelled to and fro daily. The domestic staff consisted of non-resident daily workers. Porters' duties were supplemented by student volunteers. Because of the shortage of staff, inmates continued to work in the kitchen and laundry. Absolute necessities, such as bed linen, mackintosh sheeting, bedpans, urinals, bed-gowns, and towelling,

had to be bought or borrowed, but the supply was inadequate. Meantime workmen were building operating-theatres, fitting rooms as ward kitchens, linen stores, and test rooms, and making necessary changes in the sanitary annexes of the wards. From this chaos order appeared, but even a month later medical and nursing equipment was still scanty and congestion and overcrowding still existed in the wards. A fixed nursing-duty roster was impossible, because many of the nursing staff were still subject to the exigencies of their own institutions. There were still no hospital porters.

Subsequently the central authority agreed that 200 beds in this institution could be utilised for the treatment of the civilian sick, but that 400 beds must be reserved for the reception of casualties. When the necessary structural alterations were proceeding, dysentery appeared among the poor-house inmates, and in a few days the outbreak assumed the proportions of an epidemic. At this time there were 139 patients in residence, who, with 250 inmates, made a population of 389 persons, mainly old people.

THE EPIDEMIC

Dysentery first appeared when a poor-house inmate was removed to the hospital end for observation on Sept. 29. She was notified and removed as a case of clinical dysentery the next day. Another female inmate was removed direct to the infectious diseases hospital on Oct. 2. On the 3rd 12 cases occurred among the hospital patients. Of these, 10 were thought to be the result of careless isolation of the first case, but 2 were in hitherto uncontaminated wards. Succeeding days brought fresh cases among the female inmates and among hospital patients in further wards where no dysentery had been noted. The peak of the epidemic was on Oct. 7, when 28 cases occurred in one day. Smaller numbers occurred daily from then on until Nov. 13, but, before quarantine was lifted, 156 persons (39 men and 117 women) had been infected, including 88 hospital patients, 54 inmates, and 14 of the nursing staff. There were 4 deaths, a case-mortality of 2·5 per cent.

On Oct. 5 the cases were surveyed. The initial localisation of the disease among the female inmates pointed to the probability of a carrier. Immediate steps were taken. Admissions to any part of the building ceased. Visitors were prohibited. Barrier-nursing was instituted. Inmates were stopped from working in the kitchen, laundry, and dormitories. Patients were totally confined to bed, in part to maintain a careful check on their stools. Equipment was amplified. Rigorous rules regarding the handling of food were issued. All dishes were scalded and carefully stored. The kitchen and staff were inspected daily. The issue of milk (all of which was boiled before use) and other food was delegated to one person only. Further, it was arranged that every case of illness in an inmate and the contacts, defined as those sharing the same dormitories as the suspect, should come to the hospital for observation. Why the disease should appear in "clean" wards was unexplained. Suspicion was directed to the staff. Every member of the staff was interrogated, and anyone with recent suspicious illness or a previous history of dysentery was quarantined until three successive negative stools had been obtained. The same routine was carried out with patients and inmates, and eventually the stools of every person connected with the institution were examined. To enable this to be done with any degree of success a laboratory was set up adjacent to the institution, and specimens were submitted to examination forthwith.

BACTERIOLOGICAL INVESTIGATIONS

The stools of 156 patients notified as suffering from clinical dysentery were examined bacteriologically, usually on several occasions. *Bacillus dysenteriæ* Flexner was isolated from 1 male patient, 20 female patients, and 2 female carriers. All strains fermented glucose and mannite without producing gas, were non-motile, and produced indole. Agglutination occurred to titre (1/250) with Oxford Standard Laboratory polyvalent *B. dysenteriæ* Flexner antiserum. It was exceptional for dysentery bacilli to be isolated on more than one or two occasions from any one patient, the infection evidently disappearing quickly. The female patients with dysentery included 14 nurses, but none of these were proved bacteriologically.

A search was made for carriers. First, 20 members of the kitchen staff were examined, but no dysentery bacilli were isolated from their stools. Nor were dysentery bacilli isolated from 40 healthy nurses. Stools were examined from 389 hospital patients and inmates, and 2 carriers were detected. In both instances their stools were well formed. One was a patient confined to bed, but the other, an inmate, was engaged in handling food for distribution throughout the institution, particularly for the inmates. Both were notified, and dysentery bacilli were isolated from their stools on several subsequent occasions.

Although there did not appear to be any direct evidence incriminating water or milk, appropriate bacteriological examinations were made. The water from the main inflow was of high standard, *B. coli* being present in 50 c.cm., the count at 37° C. being 3 per c.cm. and at 22° C. 10 per c.cm. Although the water in the main tank was of similar quality to that in the main, this was not true of the water obtained from taps through the distributing system. The source of pollution was traced to certain distributing cisterns which clearly required cleaning. Water from one of these subsidiary tanks, for instance, yielded *B. coli* in 2·8 c.cm., the count at 37° C. being 30 per c.cm. and at 22° C. 60 per c.cm. Although this was obviously undesirable, it is unlikely that it was responsible for the outbreak of dysentery. Milk supplied to the hospital was of a high standard. Some samples taken from jugs, however, showed a greatly increased count, due to faulty washing and drying of these utensils.

SOURCE OF THE EPIDEMIC

Primary Sources.—A survey of the data accumulated during the epidemic revealed two possible primary sources. Of the 2 carriers only 1 disseminated infection to any great extent; the other carrier, a hospital patient confined to bed, infected only one person—the woman in the adjacent bed.

(1) A carrier was found among the female inmates of the poor-house. An able-bodied woman, she worked in the institution generally, helping in the kitchen, where she handled food for patients and inmates. She was not detected until Oct. 5, when she was removed to hospital as a contact of the patients whom she had already infected. She was the source of the cases occurring on Sept. 29 and Oct. 2. The latter patient, a female, concealed her illness for two days, during which time she was employed in the kitchen. In this way the disease obtained a hold among the female inmates.

(2) Dysentery infected members of the nursing staff, 8 of whom had a typical attack beginning on Sept. 29, 1939. This was discovered only as a result of the mass interrogation of the staff mentioned previously, for none of the nurses in question had reported their illnesses. Further probing showed

that 1 of them had had diarrhœa from Sept. 3 to Sept. 17 and had relapsed with more acute symptoms on the 29th with the others. They were all her friends, and it is thought that the others were infected by contact with her. The employment of inmates in the kitchen suggested infection of food, but, since no other member of the nursing staff eating the same food had any upset, this possibility seemed remote. These nurses continued at their posts until removed on Oct. 9, and in the wards nursed by some of them the incidence of infection was very high. When removed from duty they were well, and their illness was not proved bacteriologically (see above). In normal times these nurses would have reported sick, but from a mistaken sense of duty they thought that they were helping in a difficult time by carrying on.

Secondary Sources.—(1) On Oct. 29 5 nurses sickened with symptoms of dysentery. The infective source was food supplied from the hospital kitchen, because other members of the staff on the same duty had minor abdominal upsets. This was supported by the fact that 4 of them had just come to the institution. A maid was suspected as the source, but she left immediately afterwards, before investigation could be begun. The same source infected 5 patients.

(2) Another nurse was infected by direct contact from a patient. No cases resulted from this centre.

(3) 3 cases resulted from direct contact with a male patient. Removed earlier as a case of dysentery he was reported to be free from the disease and returned to the hospital only to relapse with typical dysentery thirteen days after his first attack.

(4) Infection occurred in one instance in a previously "clean" ward. A check revealed that the only source of this could have been a night nurse from an infected ward who relieved a friend for meals.

(5) 1 hospital patient was infected by contact with the second carrier as mentioned above.

Some difficulty was caused by mild cases being missed, and a careful watch had to be kept. Barrier nursing break-downs accounted for some further spreads, but, considering the wandering habits of the old patients, this was hardly surprising. Infection by close contact was the rule throughout the epidemic. This was readily traced, for a precise list of the bed order in each ward was begun early in the epidemic and kept up to date to the end.

INCUBATION PERIOD

The incubation period in the early stages of the epidemic was five days, but in the later stages, when cases were fewer, incubation periods of seven days were not uncommon, 2 cases occurred on what appeared to be the ninth day, and 4 on the tenth day, after contact with infection. These figures are longer than is generally accepted. A minimal quarantine period of fourteen days was therefore enforced.

CONCLUSIONS

Important factors bringing about the epidemic were (1) the bringing together of a susceptible population and a population with endemic dysentery; (2) the neglect of nurses to report personal illnesses; (3) the occurrence of carriers among the inmates, and the use of inmates in the general kitchen and in their own quarters; (4) overcrowding in the wards, permitting easy contact infection; and (5) the lack of nursing equipment and adequate sanitary annexes.

It is difficult to control a staff gathered from so many sources. Many items which run smoothly in an average hospital were found to go wrong, and every detail of procedure had to be inspected. The lack of trained hospital porters was felt, and the handling of food and linen had to be carefully supervised, much time being taken up in perfecting the system. In fact, the ordered discipline of the average hospital was lacking.

No institution should be taken over and occupied for hospital purposes without a considerable measure of preparation, including a survey of its previous epidemics. Where a history of previous endemic infection exists, great care should be observed. It is undesirable to share a building with its previous inhabitants. A nucleus of trained nursing and kitchen staff should be installed before the occupation of the building by patients, and overcrowding should be steadfastly resisted except in a grave emergency.

SUMMARY

An epidemic of dysentery broke out in a poor-house, part of which had been converted into an emergency hospital. Two primary sources of dysentery were found: (1) a female inmate of the poor-house, who handled food in the kitchen and worked in other parts of the institution, proved to be a carrier of *B. dysenteriæ* Flexner; (2) a nurse infected a small group of other nurses. Secondary sources are also mentioned.

The steps taken to combat the epidemic are described, including bacteriological investigation and examination of water and milk supplied to the institution.

The incubation period was 5–10 days—i.e., longer than is usually recognised.

It is suggested that no institution such as a poor-house should be used as a hospital without a survey being made of its history of epidemics, and that such a building should never be shared by the old and the new inhabitants.

We wish to thank Dr. W. G. Clark, medical officer of health for the city of Edinburgh, for permission to publish this article and for much helpful criticism.

Influenza and Pneumonia

Owing to delay in the publication of the Registrar-General's weekly returns it is possible to trace the course of this year's vintage of 'flu (of which the clinical aspects were described on p. 192, Jan. 27) only to the middle of last month. The figures below show that there was in the first week of the year an abrupt rise in the number of deaths attributed to influenza in the great towns and in the notifications of primary and influenzal pneumonia in the country as a whole. A further increase took place in the second week of the year, but the rate of increase

	INFLUENZA DEATHS IN THE GREAT TOWNS			NOTIFICATIONS OF PNEUMONIA IN ENGLAND AND WALES		
Week ending in 1939–40	1939–40	1938–39	1937–38	1939–40	1938–39	1937–38
Dec. 9	23	26	46	445	796	1103
,, 16	25	36	52	455	952	1129
,, 23	27	41	46	456	836	1106
,, 30	46	89	59	662	1147	1663
Jan. 6	94	144	77	1109	1669	1633
,, 13	158	214	91	1457	1804	1652
,, 20	—	223	73	—	1644	1326
,, 27	—	173	60	—	1512	1302
Feb. 3	—	210	66	—	1442	1129

slackened. Owing to movements of population it is impossible to compare at all accurately the present figures with the past but, even allowing for evacuation, it appears that up to mid-January the deaths from influenza were probably below the level of the minor epidemic of last year, while the incidence of pneumonia, after a period at an exceptionally low level, was still not unsatisfactory.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED JAN. 13, 1940

Notifications.—The following cases of infectious disease were notified during the week: Smallpox, 1 (Hailsham R.D.); scarlet fever, 1141; whooping-cough, 787; diphtheria, 745; enteric fever, 11; measles (excluding rubella), 2740; pneumonia (primary or influenzal), 1457; puerperal pyrexia, 160; cerebrospinal fever, 107; poliomyelitis, 6; polio-encephalitis, 4; encephalitis lethargica, 8; dysentery, 31; ophthalmia neonatorum, 66. No case of cholera, plague or typhus fever was notified during the week.

To the 107 cases of cerebrospinal fever, Wales contributed 25 (Brecknock, 1; Carnarvon, 2; Caermarthen, 1; Denbigh, 5; Flint, 1; Glamorgan, 6; Monmouth, 8; Pembroke, 1) and the adjacent counties of Chester, 3 and Salop, 3. Ten English counties accounted for 52 other cases (Durham, 4; Essex, 4; Lancaster, 10; London, 5; Middlesex, 5; Northumberland, 4; Southampton, 4; Stafford, 5; Surrey, 5; Warwick, 6).

Deaths.—In 126 great towns, including London, there was no death from small-pox or enteric fever, 1 (0) from measles, 1 (0) from scarlet fever, 5 (0) from whooping-cough, 17 (0) from diphtheria, 32 (3) diarrhœa and enteritis under 2 years, and 158 (14) from influenza. The figures in parentheses are those for London itself.

Fatal cases of diphtheria were scattered over 14 great towns, Manchester reporting 3 deaths, Sunderland, 2. Portsmouth and Birmingham each had 4 deaths from diarrhœa.

Of the 144 deaths from influenza outside London 33 were reported from the south-eastern area (Enfield 4); 59 from the northern area (Liverpool 6, Manchester 5, St. Helens, Bolton, and Leeds each 4); 32 from the midland area (Birmingham 9, Bristol 17, Leicester 4); 4 from the eastern area; 6 from the south-western area; 10 from Wales and Monmouthshire (Cardiff 4).

SPECIAL ARTICLES

SOCIAL ENVIRONMENT AND THE WAR

A CONFERENCE organised by the Housing Centre was held at the house of the Royal Institute of British Architects on Feb. 2. It was attended by representatives of housing, economic, social service, and architectural bodies and was presided over by Lord BALFOUR OF BURLEIGH, chairman of the Medical Research Council, in the morning session, and by Lord HORDER in the afternoon. Lord Balfour explained that the object of the conference was to set up a council to promote a national plan for social environment through research groups and in other ways, and to make widely known the need for such planning. The defects of social organisation revealed by the war, he said, provide a great opportunity for such a movement.

Sir WALTER LANGDON-BROWN spoke of the part the family doctor should play in the extended health services. What is wanted is a complete sequence of medical supervision throughout life. Such an organisation must come under the state or the municipality, but as far as possible the work should be carried out by part-time medical officers. Only in this way can the patient have a reasonable freedom of choice of doctor. It will be a bad thing if the patient can no longer refer possessively to "my doctor." Such facilities as X-ray and pathological examinations should be within the reach of all, not merely the very rich and the very poor as at present. But he foresaw great difficulty in the extension of anything like the panel system throughout the community. The first effect among the well-to-do classes would be to increase their flight to Continental centres as soon as peace was restored. It is feasible, he said, to extend health insurance on its present lines to all those earning up to £250 a year and their dependants. Above that limit he suggested an optional insurance scheme with premiums on a sliding scale based on the income-tax assessment. Those with larger families would have the advantage of paying less for medical attendance, although the doctor would be remunerated on a per capita basis. It would probably be necessary to limit the number of patients who could be accepted by any one doctor, but every doctor should have the right to take private patients who did not desire to avail themselves of the option of insurance. The more the general practitioner could be kept in touch with hospitals and part-time clinics and the more opportunity he had of following up his patients under hospital conditions, the greater would be his efficiency. The position of the doctor in respect to his patients is the same as that of a prime minister to a constitutional sovereign. It is his duty to offer advice, and if the patient refuses to take it on a vital matter he can only withdraw from the case. Such words as "defiance" and "orders" should have no place in the vocabulary of the doctor-patient relationship. He then referred to what Dr. Stephen Taylor has described in these columns as "suburban neurosis"—the vague symptoms of ill health, without physical signs of disease, induced by the dissatisfaction arising out of the intense loneliness which confronts many people in the dormitory areas. There is no common meeting ground and no community of interest. The continued draining away of life from the countryside to the towns, or their surrounding suburbs, is raising old problems in a new form. Good may yet come out of the evil of compulsory evacuation of industries by breaking up these huge "conurbations" as they are called. Decentralisation of industries is a crying need, and the garden city is the model towards which we should look where there are opportunities for renewing those communal interests which are necessary both to mental and physical health.

SOCIAL SERVICES IN WAR-TIME

Lord HORDER, in opening the afternoon meeting, said that the social services, though seriously affected, are not stagnating as a result of the war. The war caused a sudden shock to all routine, but when this was recovered from, life went on and with it the social services. Many thousands of men and women are now living under a "tough" instead of a tender regime. That is not a bad thing for society. Many thousands are better employed, fed and paid, and their welfare is the direct concern of the state. Evacuation has created a new and desirable extension of the social services, and it has also given an opportunity for widespread discussion of their shortcomings. In this war life is controlled, food is controlled, and even noise is controlled. State subsidies of fifty million pounds a year are being spent so that food shall be purchasable and the housekeeper of small means freed from the fear of exploitation.

All the major and even the minor needs of life are being kept constantly under review—warmth, transport, sleep, cooking, housekeeping. Home nursing is being taught to about 1 in 8 of the population. War is not a bad time for progress in social work. It is a barbaric and destructive thing, and yet it is a great accelerator. All the applied sciences are speeded up by emergency, and in peace-time it is the application of science to human life that lags so much behind. Money is being spent more freely on things which tend to preserve the citizen, who, through the opportunities of national service, develops a corporate sense and a new social life. The war had done more in the direction of physical fitness in six months than the national campaign had achieved in three years. But if he were asked whether the ordinary routine social services can be continued at the 100 per cent. level during the war his reply must be "Don't be silly." The prior claim of winning the war has to be borne in mind, and God help social service and the environment of them all if they lose it! Either we keep what progress we have made or we go Nazi. The new council should act as a field force to bring expert criticism to bear on the present emergency social measures, to decide how they are acting and which of them is worth retaining.

Mr. RUSCOE CLARKE, F.R.C.S. (secretary, Joint Medical Socialist Committee) said that everyone is aware of the possibilities for health progress which have resulted from modern science, but owing to lack of organisation many of these advances cannot be brought into practice. Lord Horder had painted rather a rosy picture of the health services, but the Joint Medical Socialist Committee are continually receiving complaints of distortion and reduction of the medical services as a result of the war. No real health services accompanied the evacuation of children. The Emergency Medical Service was organised through the voluntary and municipal hospitals, but these hospitals, crippled by the demands of the service, have still to go on with their diminished resources looking after the ordinary sick. The divergence between preventive and curative medicine, and the competition between private and hospital practice, and between insurance and municipal services, have also been illuminated. The present situation has exposed the "basic anarchy" and has provided an opportunity to start planning for better organisation within medicine itself and a better relation of medical and health services to other social needs. Any planning in relation to health must include the coördination of all the existing health services and also a consideration of the economic factor. Where is the money coming from? Unless that is considered in planning, any scheme will be Utopian.

TESTS OF HEARING

IN the last few years the audiometer has been increasingly used for the detection and measurement of defects of hearing and the value and technique of audiometer tests were discussed on Feb. 2 by the section of otology of the Royal Society of Medicine. Mr. A. W. G. EWING, Ph.D., who opened the discussion, said that in the examination of school-children these tests were recommended in this country, while in some American states they were compulsory. Joint committees of otologists and physicists have been set up here and in the United States to formulate standard specifications for audiometers. In the deaf patients that attend Dr. Ewing's department at Manchester for the education of the deaf comparisons are made between audiograms and the hearing capacity for speech. Two main types of audiogram are distinctive. The first shows a fairly uniform loss of acuity over the whole range of hearing which is more marked for air than for bone conduction. This more or less straight line audiogram is seen when the conducting part of the auditory apparatus is at fault. The second distinctive type is that in which both air and bone conduction cause a slope more or less sharply down from left to right of the chart because the hearing loss is progressively worse for the higher tones. Severe deafness for high tones indicates a lesion of the cochlea itself. It has been found experimentally that the suppression of high tones interferes severely with the intelligibility of speech because it destroys the most distinctive characteristics of consonants, and, to a lesser extent, of vowels. For this reason a high-tone deafness noticeably reduces the capacity to hear speech. In patients with an even hearing loss over the whole auditory field, Dr. Ewing finds that an estimation of the hearing loss for speech can be formed from a study of the loss at 1024 cycles. At this pitch the average loudness level of conversation heard at a distance of one metre varies from 40 to 70 decibels above the normal threshold of audibility. Provided that the loudness level of speech can be kept at least 30 decibels above the threshold of audibility speech can be understood with reasonable accuracy. This is why patients with an even hearing loss often benefit from the use of modern valve hearing aids giving good reproduction of sound in the upper half of the speech range. In high-tone loss, on the other hand, the accuracy with which the patient hears speech is reduced out of all proportion to the diminution in its apparent loudness. He may hear a foghorn a mile distant but fails to follow average quiet conversation. To test a patient's capacity to hear speech is to test much more than his capacity to hear. Ability to follow what is said depends also on familiarity with the thought and vocabulary of the speaker. It involves the activity of the whole mind and is only possible as the result of past experience. These facts are well brought out in telephone conversations, where intelligence is brought into play to relate imperfectly heard phrases or proper names to their context. For this reason clinical tests of the capacity of deaf patients to hear speech, although needful, cannot be as precise as those with a pure-tone audiometer. A trained worker in controlled acoustic conditions can obtain scores indicating approximately the extent to which vowels and consonants are heard correctly. This procedure is a valuable basis for giving advice about the choice of a hearing-aid. The score obtained with the unaided ear can be compared with the scores obtained with different aids. The selection of material for such tests is not easy. Dr. Ewing relies at present on a graduated test, beginning with numbers as a form of practice, followed by tables of simplified nonsense syllables and by connected speech at varying distances.

Mr. W. M. MOLLISON said that before the introduction of the audiometer there was a noticeable lack of uniformity in the methods of testing and recording the hearing capacity. While the audiometer has been rightly hailed as an enormous step forward, it has certain shortcomings that should not be ignored. Its range is limited to frequencies between 64 and 10,000, and there are times when important information can be gained from a study of the acuity for frequencies either above or below this range. The deafened patient is only concerned with his inability to appreciate the spoken word and it is not always possible to estimate this from a study of his hearing loss for pure tones. Nevertheless, the audiometer is a fascinating instrument to use because of the exact results that it can give.

Mr. TERENCE CAWTHORNE said that the pure-tone audiometer and the voice each play their part in the investigation of the auditory apparatus. The audiometer reveals degrees of hearing loss for pure tones so slight that they do not affect the ordinary speech test; and in the severely deafened it acts as a guide to the class of hearing-aid that is most likely to be of help. But in the actual choice of a hearing-aid some form of speech test is essential. While it is true to say that an efficient pure-tone audiometer is an instrument of precision, it should not be assumed that the records of audiometric tests are of necessity equally precise. Many sources of error may creep into the audiometric examination and cause inaccurate results. However, such inaccuracies are more easily guarded against than the variable results given by other pure-tone tests or by speech tests.

CHILD GUIDANCE

CHILD-GUIDANCE work in this country owes its existence to the Commonwealth Fund of America and through it to the late Mr. E. S. Harkness and his family. In 1925 Mrs. St. Loe Strachey (now vice-president of the Child Guidance Council) when visiting America was so impressed by the work of the child-guidance clinics there that she decided to promote similar work in her own country. But the difficulty was how to raise funds to train and pay the salaries of the highly qualified workers needed. Mrs. Strachey visited the Commonwealth Fund offices where she pleaded her cause to such good effect that a promise was given of financial help.

The Child Guidance Council was established in 1927 and in the following two years the London Child Guidance Clinic set up to demonstrate the value of child guidance through the medium of a staff comprising psychiatrist, psychologist and psychiatric social worker. The fund provided grants to enable the staff of the new clinic to visit America and observe the work in the child-guidance clinics there. At that time no training existed in England for social workers interested in mental health problems and the first psychiatric social workers were trained in America at the expense of the fund. Meanwhile, the Child Guidance Council helped to establish a mental health course for the training of psychiatric social workers at the London School of Economics, and the cost was borne by the fund.

From 1929 to the outbreak of war the London Child Guidance Clinic has carried on work among children referred from London County Council schools, by parents, doctors, probation officers, and voluntary associations. It has been the only centre for the practical training in child guidance of the mental health course students, and has been the chief source of supply of staff to other clinics throughout the country. For the past few years the clinic has been engaged in a financial struggle, for the Commonwealth Fund grant was on a decreasing basis, the fund holding the view that if the work is of value the country should be prepared to finance it. The struggle, a losing one, was terminated by the war and the clinic closed immediately war was declared.

The grant from the fund to the Child Guidance Council, which is concerned with the general organisation of child-guidance work in Great Britain and has helped in the establishment of between 50 and 60 clinics is to continue, subject to a yearly decrease of £500, until 1943–44 and the office of the council is now removed to 23, Queen Square, Bath.

The fund has allowed the council to use the sum allocated to training in its budget for the assistance of the Child Guidance Training Centre in Cambridge, established by Miss L. G. Fildes, Ph.D., to provide, in coöperation with Addenbrooke's Hospital, a centre for the practical training of students of the mental health course at the London School of Economics (now in Cambridge). The council is also able, through the generosity of the fund, to pay the salaries of psychologists and psychiatric social workers lent by the Joint Mental Health Emergency Committee to local authorities and others who are faced with problems of difficult behaviour among child evacuees. This joint committee has been set up by the voluntary mental health organisations to put into effect some measure of coöperation as an earnest of their preparedness to unite in accordance with the recommendations of the Feversham Committee which reported last June.

This country can best repay its debt to the Commonwealth Fund by ensuring that child-guidance work here is carried on in a manner worthy of its great beginning.

MEDICINE AND THE LAW

"During His Majesty's Pleasure"

Mr. Justice Hawke took occasion last week to remove the false impression that, where an accused person is found unfit to plead by reason of insanity or is found "guilty but insane," the order of the assize-court that he be detained "during His Majesty's pleasure" has the effect of a life sentence in a criminal lunatic asylum. Just as the condition of any other patient in any other mental hospital is a matter of constant review and report, so the condition of what (pending the passing of the Criminal Justice Bill) we still call the "criminal lunatic" is periodically examined with no less care. The patient at Broadmoor is released at the earliest moment when this step can safely be taken. The reminder may have been addressed in part to the members of the bar as well as to the jury and other persons in court. A generation ago, at any rate, counsel defending an accused person sometimes deliberately refrained from running the defence of insanity. They argued that a simple verdict of "guilty" would mean a limited sentence of imprisonment, during which the prisoner would have the benefit of a regular method of life under appropriate supervision, emerging at a definite date as a free man; whereas the order for his detention "during His Majesty's pleasure," if found "guilty but insane," meant an endless incarceration in the company of criminal lunaties. This view perhaps dies hard. It is well that it should be known that the treatment and prospects of the mental patient are, subject to the reasonable necessities of the case, assimilated. The same desire to restore him to a rational life exists in the criminal as in the civil institution.

Insecticide for Liquorice Powder

In Hibbett *v.* Leicester Corporation and others damages were awarded last week against the resident medical officer and two nurses on the staff of a municipal hospital. A 13-year-old boy died of irritant poison: insecticide had been administered to him instead of liquorice powder. The insecticide was kept in a tin which had been labelled "liquorice powder." Mr. Justice Oliver held that to put insecticide in a tin labelled liquorice powder and to keep the tin in the medicine cupboard was a dangerous thing; it was like a live bomb which some day would explode and injure someone.

The city analyst gave evidence that the insecticide contained 38 per cent. of borax and 62 per cent. of pyrethrum; neither of these ingredients was classed as a poison. Asked by the judge if he would have liked to take a teaspoonful, he answered "No, but I was surprised at the effects." Dr. E. M. Ward, pathologist to the city health committee, said that the powder was described as harmless to children; he would not have expected a teaspoonful to do any harm. Sir Bernard Spilsbury, on the other hand, expressed the opinion that borax was a poison unless taken in very small doses or in a weak solution. It was rare, he said, for adults to be given gr. 15; usually the dose was gr. 5, a child's dose being proportionately less. Sir Bernard agreed that it was common to keep aperients in the ward; the sister in charge could administer them at her discretion. The boy's life would certainly have been saved if he had been properly treated within an hour of taking the poison. If a doctor in charge of a ward found several boys sick, he ought to make close inquiries into the possible common cause; if told that they had been given this powder, he should have made some attempt to test it. In answer to the judge, he added that the simultaneous sickness of a number of boys was a clear indication of poisoning of some kind. The judge held that the hospital doctor had fallen short of the standard of care required of him, though he hoped that the verdict would not prejudice his future career. The doctor's mind should have "leapt to the conclusion" that the boy had probably been poisoned. A verdict of £450 damages was awarded against the doctor and of £25 each against the sister and nurse concerned. The judge ruled that there was no case against the Leicester corporation, presumably on the familiar ground that its sole duty was to appoint competent staff (Hillyer *v.* St. Bartholomew's Hospital).

Two minor incidents in the case may be mentioned. The judge ruled that the defendant doctor, when directly asked who he thought was to blame, must answer the question. "If I must answer," said the witness, "it was the person who administered the dose"—i.e., the nurse in the ward. It was placing a defendant in an embarrassing position to ask him thus to decide the issue before the court. In the second place, the judge is reported to have spoken critically of the evidence taken at the coroner's inquest. "One of the things which depresses me about coroner's inquests," he observed, "is that the coroners never seem to ask any questions except leading questions." Members of the public might feel inclined to rejoin that the strict insistence upon rigid rules of evidence is one of the things which depress them in a court of law. A coroner, after all, is entitled to get the facts in his own way; an inquest is not the trial of a specific charge against a specific person.

SCOTLAND

(FROM OUR OWN CORRESPONDENT)

THE WASTE OF CHILD LIVES

AT the annual meeting of the Scottish branch of the Queen's Institute of District Nursing last week Prof. Charles McNeil, professor of child life in Edinburgh University, said that over and above their maternity work, in connexion with their children's nursing, the Queen's nurses carry out the duties of health visitors. More should be done for the safety of the child than is being done at present. The infantile mortality in Scotland for 1937 was a little over 80 per thousand. In Holland the figure was 38, and if Scotland can reduce the infantile death-rate to that level they will save annually 4000 children in the first year of life. These deaths can be prevented by the energy and knowledge of trained women such as are found among the Queen's nurses. More health visitors are required with concentrated training for that part of the work which deals with the life and health of young children. Holland achieved this position not by luck but by hard work and the intensive training of midwives. The same could be done in Edinburgh and throughout Scotland by the training of home nurses. He did not think that the public appreciates the true facts. Even in time of war, and perhaps more so now when there is wastage among the young men, everything possible should be done to stop the great wastage of child life.

Another speaker at the same meeting said that the mortality-rate at ages under two weeks in cases not attended by the Queen's nurses amounts to 31·6 per thousand, whereas of the cases attended by the Queen's nurses in the same age-period the rate is only 16·7.

SCOTTISH STUDENTS AND CONSCRIPTION

At a meeting of the general council of St. Andrews University, Sir James C. Irvine, the principal, discussed the position of students with regard to war service. The universities, he said, have been in close contact with the Government in order to define the branches of study which are necessary for the conduct of the war, the welfare of the community and the reconstruction of the community when peace is restored. That accounts for the reserved categories of students. Some, like engineering and medical students, are set aside so far as military service is concerned. This is a vast improvement compared with what happened in the last war. The only practical difficulty that has emerged affects the medical students. On what grounds can it be decided when a man is a medical student? At first the dividing line was drawn at the second professional examination, but later students were reserved if they had passed the first professional examination and had done two terms of anatomy and physiology. This last arrangement appears to be to the disadvantage of the Scottish student as compared with the English. Many students in England study chemistry, physics, botany and zoology at school, take the higher school certificate, and on entering the medical school begin straight away with anatomy and physiology. In Scotland, however, the premedical sciences have to be studied at the university. This means that at the end of the first year the English student qualifies as a medical student while the Scottish man, of the same age and at about the same stage, does not. This inconsistency is not as serious as it appears, for the number of English students who can qualify in that way is comparatively limited while some universities in England have regulations which make them exactly parallel with the Scottish universities.

EDWARD STEPHEN HARKNESS

Among the many tributes which have been paid to the late Mr. E. S. Harkness, the American railway magnate and philanthropist, who died in New York last week, only a few have referred at any length to what seems one of the most significant of his interests, namely, the Commonwealth Fund. The fund was founded by his mother, "to do something for the welfare of mankind," and he was himself the president and took a very close interest in its activities. It is concerned with numerous philanthropic works in the United States, in Great Britain and on the Continent

of Europe, mainly in the realms of public health and mental hygiene. About twelve years ago, largely at the instigation of Mr. Harkness himself, the fund established a number of fellowships to enable graduates of British, and later Empire, universities to spend two years in the United States. The object of these fellowships is partly to allow selected men to engage in advanced postgraduate work at what are in many instances the most suitable institutions for the individual purposes available, and partly to allow British men to acquire a knowledge of the United States, its people, and its institutions. I have myself enjoyed these benefits. The fellowship enables the holder to live comfortably though not expensively and the fact that two years' residence in the States is available is not the least of the advantages. Probably all Commonwealth fellows agree that the second year is even more useful than the first. During the first six to twelve months they are really only becoming acclimatised and settling down. During the second year they feel, in many instances, completely at home and are able to adopt the outlook of the American citizen to such a degree as to feel the inner significance of the details of American customs. The Commonwealth Fund insists that the fellows travel widely throughout the United States for they know well, what too few tourist agencies realise, that the United States is a continent with an enormous diversity of geographical as well as ethnological features. Each year an enormous amount of personal experience is acquired by some thirty or more young British men who return to Great Britain with a feeling that they really know something of the United States.

ST. ANDREW'S GRADUATION

Sir James C. Irvine, principal of St. Andrew's University, addressing the new medical graduates, said they were entering life for the first time. They had now achieved a full fellowship of the university and were free agents to do what they would, to study what they liked, and to use or abuse the privileges they had enjoyed and the opportunity they had had to equip themselves for their life's work. They were fortunate in being pledged to a noble profession and in being able to contribute something to making this a better world, and to bringing relief to suffering and comfort to distressed homes.

WILKIE SURGICAL SCHOLARSHIPS

At a meeting of the court of the university of Edinburgh regulations were adopted for the David Wilkie scolarships which were founded by a bequest by the late Prof. Sir David Wilkie. These scolarships are open to graduates in medicine, arts or sciences of any university or to licentiates in medicine of any approved body, preference being given to suitable graduates of the University of Edinburgh, for research in surgery approved by the Faculty of Medicine. They are tenable for one year at a time but the holders will be eligible for reappointment for a second year. The approximate annual value will be £100 (three scholarships), £150 (two scolarships), or £300 (one scholarship).

It was intimated at the same meeting that the Senatus had resolved to hold a special final professional examination in medicine in March 1940.

IN ENGLAND NOW

A running commentary from our Peripatetic Correspondents

IT is curious how some experiences which at the moment of their reception are startlingly clear and vivid sink back rapidly and completely into the dead level of the past. There was a time in 1918–19 when as a doctor I thought I had plumbed the deepest agonies of helplessness when I watched unavailingly at the bedside of officers and men stricken by influenza; and that experience remains as sharply cut as at first and almost as painful in retrospect as it was in that ghastly first winter of the peace. But the same does not apply to my personal experience of that peculiarly unpleasant disorder. I had it with scores of other doctors in 1919 and put it away behind me as one of the better-forgotten memories, and was lucky enough to evade its clutches in all the onslaughts it has made in this country since—till last week. Then old bits of clinical lore came floating easily back to my memory and I knew that this time there was no escape. But what surprised me was what I had forgotten. I had forgotten the overwhelming celerity of the invasion; normal at the beginning of breakfast and a complete ruin half an hour later. I had forgotten the entire surrender of body and mind to a helplessness and a hopelessness of which now a day or two later I am thoroughly ashamed, as of a craven surrender to an unthinking panic. But what most of all I had forgotten is the curious "jar" in the even mechanism of one's internal existence, and the complete dissociation of the component parts when the engine starts firing again. Your body seems to be miles removed from your observing eye: you can watch it twist and squirm in the paroxysms of cough, as if it was no part of you at all. All the different departments of your body have set up independent shops and instead of working together happily towards the Happiness of the Whole are, shall we say, distinctly leftish in tendency, with the not unusual accompaniment of an apparently profound distrust in each other's capacities and ideologies! But the simile has driven me on to debatable ground. What I am trying to convey is my lack of memory of this sudden and profound dissociation, not merely of ideas, but of purely physical functions such as the sense of taste, smell and touch. Judgment of distance went too. Until a few hours ago I could not be certain of replacing the glass on the tray; the tray was there—I could see it—but any connexion between the glass in my hand and the tray was simply non-existent. Now it has all come back, and has left me wondering whether in good time the final dissociation will be as painless, as surprisingly rapid, and as curiously interesting.

* * *

So far the war has made little change in our method of living in this part of the Midlands. The expected rapid rise in wages has not yet made itself generally apparent. There is none of that eager rush to buy unnecessary, or useless, articles so apparent last time. A musical-instrument dealer was complaining the other day that there is no increased demand for pianos, for which last time there was keen competition—as for furniture. They took second place only to American organs, whose superior popularity depended, apparently, upon the fact that they had more machine-made carving on their outer cases. The non-recurrence of this particular demand, however, is not due so much to delay in the arrival of increased purchasing power as to all-round improvement in popular taste. Cheap and attractive furniture is more easily come by than it was twenty years ago, while pianos and American

organs, as ornaments, are considered somewhat out of date if there is nobody available to perform on them. Yet the musical-instrument vendors have little to complain about. As the sales of pianos and organs, for furniture, have dropped, the demand for wireless sets, for use, has grown. It is unusual to find a house, however humble, without one.

What will happen this time nobody can say with any certainty, but it is unlikely that we shall see again the frenzied rush to the public-houses when word gets round that a fresh consignment of beer has arrived. . . . During the last war men, and some women, crowded to the pub counters, clamouring for what they considered their fair share. In practice it was not infrequently a quite unfair share. Arms were stretched across shoulders, pots were snatched, hurriedly emptied, passed back for more, not because people were unduly thirsty, but because they were afraid they would not get what they considered their due. The result was unsatisfactory. A part of a day of surfeit was followed by a spell of famine, unsatisfactory to everybody. Authority almost certainly will take steps towards the avoidance of that sort of thing, and anyway, manners have changed very much for the better. People are less self-seeking, and beer-drinking is regarded less as a sacred rite than it was. Actually beer has never recovered its pre-last-war price nor its old quality. We are, in fact, starting this war with the price of beer and income-tax at an almost prohibition level. That must be causing Authority to do a good deal of hard thinking.

So far, in these parts as elsewhere, the chief menace of the war has been provided by the blackout. In the early days, when all the hospitals were emptied in order that there might be plenty of room for imminently expected air-raid casualties, the resident medical staffs were left with practically nothing to do but play darts and other games of skill and chance. However, the blackout came to their rescue. It provided them with victims of road accidents due to the pitch-black state of the streets, and soon they were getting plenty of practice in the treatment of injuries and the giving of evidence in the coroner's court. There were those who questioned the wisdom of emptying, almost completely, the hospitals, particularly those who saw for themselves the suffering thereby caused to many. There were others who wondered whether the almost complete darkness served so generally useful a purpose as it was thought it did. There are those who still wonder—perhaps rather more fervently. They ask whether the blackout will prevent hostile aircraft from reaching their objective in the face of the fact that rivers, canals, railways cannot be hidden effectively. They point out that peaceful places, if blacked out, will be every bit as vulnerable as munition areas, also blacked out; that hostile aircraft, blinded, cannot distinguish between legitimate and illegitimate targets. That, however, is not our immediate affair. What does concern us, as doctors, is the effect of the blackout on our prospective patients. About that there can be no question. It does have a most marked depressing effect. That is not good. Anything that depresses, or adds to depression, should be avoided whenever possible.

Specific war psychology as yet has hardly come into play. Here and there we come across a woman who is fretting, not so much because her sons are away on active service as because she hears nothing of them. The difficulties put in the way of getting a message home no doubt serve a useful purpose in concealing from the enemy the whereabouts of this or that unit of the army, navy or air force; but one is constrained to ask whether the useful purpose may not be offset by a really damaging effect on the morale of the home front. So far this war is different from other wars of which we have experience. We are told that victory for the Allies will come sooner or later by collapse of civilian morale in Germany, rather than by defeat in the field. But collapse of morale may not of necessity happen just where we want it to happen. It follows that everything should be done to keep up civilian morale at home. More frequent letters, or even postcards, should help. Half a dozen words on a postcard are likely to have a most stimulating effect, particularly if they be the sort of words sailors and soldiers have a way of writing. That is a suggestion which might well be passed on to naval and military headquarters by high medical authority! The right sort of psychology, properly applied, goes a long way towards winning wars.

* * *

A unit medical officer, though seldom in the limelight unless an epidemic breaks out and there is no hospital accommodation available, can wield a good deal of quiet power. Early in this war a certain Captain Upright was posted to a duplicate territorial battalion to take charge of the militia training company. He was quick-witted and charming but, being a regular soldier, he liked to see things arranged in rows and all looking alike and frequently pointed out to the unit, in the kindest possible way, the lack of uniformity and tidiness about its kits and troops on and off parade. Their saluting, for example, was deplorable. Some of the men did not salute at all; they pulled their forelocks and said "Mornin', zor," which was all very shocking. Without having the least intention of doing so Captain Upright contrived to make everybody in the mess feel very small and inefficient. In his presence the adjutant began to wear a hunted look and soon the C.O. was not altogether at ease. Needless to say the billets occupied by the troops under Captain Upright's own command were models of neatness and elegance: the floors scrubbed and shining, the blankets neatly folded to a pattern and the kits dressed by the right in perfect alignment. Now the unit M.O., being a doctor and not a soldier, realised that an outward and visible show of uniformity neither made men uniform nor, for the matter of that, necessarily more efficient, but being only a doctor he held his peace. However, he was attached to the unit in more senses than one and determined to strike a modest blow on its behalf. He decided therefore to inspect the militiamen's billets (which he was perfectly entitled and, indeed, in duty bound to do) but, instead of going round during the morning when he might have been expected, he chose rather to visit them late at night after Captain Upright had gone home. *Cum felis abest, licet muribus ludere* and what a state of things he found, to be sure! Windows frowstily shut, gas-fires left burning in unoccupied rooms, lights blazing in unblacked-out corridors, food lying exposed in cookhouses, clothing (including boots) in meat safes and, in fact, every sin that could possibly be committed against the respectable goddess of hygiene and sanitation. The M.O. made no lurid report to the orderly officer or adjutant. Instead, he wrote a short summary of his findings and enclosed it with a friendly personal letter to Captain Upright. Thenceforward there were no outbursts of efficiency from that gallant officer.

A special address on Alcohol and Road Accidents in the Blackout in War will be given by Mr. W. McAdam Eccles on Wednesday, Feb. 14, at 4.15 P.M., at 11, Chandos Street, London, W.1. Sir Robert Hutchison, P.R.C.P., will take the chair.

LETTERS TO THE EDITOR

VISITING IN CHILDREN'S WARDS

SIR,—In your leading article of Jan. 27 you deal somewhat cavalierly with the psychological case in favour of children in hospital being visited. You state that "with few exceptions no child mopes in a children's ward," that "in a few days the young child, at any rate, cheerfully adopts the nursing and medical staff *in loco parentis*" and finally that "the child does not need visitors in the same way as does the adult patient." You conclude by dismissing the psychological arguments as sentiment.

Now whilst no child psychiatrist would wish to deny the very real dangers associated with infection in a children's ward, few would accept your conclusion that the case for visiting is mere sentiment. In child-guidance clinics cases are not infrequently seen where the emotional disturbance appears to have developed following a long period in hospital. Some of the most serious cases of chronic delinquency have occurred in children who during their early years have spent many months unvisited in hospitals.

For instance, one very antisocial boy of six who was a persistent thief had contracted diphtheria at eighteen months and was in a fever hospital for nine months with other infections before returning home. During this time he had never been visited. It is not surprising therefore that on his return home he failed to recognise his mother, called her "nurse" and refused to eat for several days. From this time onwards he had never shown his mother affection and had grown up into a solitary hard-boiled character.

Another case was of a little girl aged eight and also a chronic pilferer. She had had a remarkably similar history, being in hospital unvisited for nine months during her second year. She also had failed to settle down on her return home and had also grown into an isolated character. Her mother remarked that family events, such as the birth of a new baby, left her uninterested and unconcerned, "as though she did not belong to us."

Now these cases and several others which could be quoted suggest that the character development of the young child can be very gravely jeopardised by long periods in hospital unvisited. Dr. John Rickman, in a recent letter to your columns on the evacuation of young children, pointed out that separating such children from their parents for long periods imposed a considerable strain on the child. This is no less true when the small child is sent to hospital. Actually, contrary to the implications of your article, there is strong reason to believe that the younger the child, the more important to him are visits from his parents, and it is the adult who can most easily do without visits. However this may be, it would be a great pity if this important question was regarded as settled. A great deal of careful psychiatric research upon the short and long-run effects of hospitalisation on children is required before a wise conclusion can be reached.

I am, Sir, yours faithfully,

York Terrace, N.W.1. JOHN BOWLBY.

THE CASE FOR A REHABILITATION BOARD

SIR,—Your leading article (Jan. 20) on the rehabilitation of tuberculous patients, together with the previous discussion of a plan for British hospitals, prompt me to voice views which I have been forming for some time past. Here at Benenden we receive patients from all over the British Isles, and the amazing discrepances which exist in the facilities available to tuberculous patients in different parts of the country have been vividly brought to my notice. Apart from personal experiences, a glance through the pages of the Handbook of Tuberculosis Schemes (N.A.P.T.) will reveal the truth of my contention. These discrepances apply not only to aftercare organisations, but also to facilities for diagnosis and treatment. Two examples may serve in illustration.

1. A patient was admitted here last week who had a hæmoptysis last June. He was sent by his private doctor to the local tuberculosis dispensary where he *was not X-rayed* and was told *to report again if the trouble recurred*. Fortunately (or unfortunately) the trouble did recur. I find that he now has cavitation in both lungs, that on one side being unquestionably of recent origin. The effect of delay in diagnosis is obvious, and I find on inquiry that the dispensary in question is not equipped with an X-ray apparatus.

2. A patient was recently discharged requiring artificial-pneumothorax refills. On application to his county authority it was stated that the patient would have to travel some forty miles by 'bus to the nearest clinic. This although he lived within ten miles of a large county borough with full facilities for such treatment.

Many other examples could be cited of this flagrant waste of time, money and thought spent on sanatorium treatment. Should not the whole problem of tuberculosis be dealt with on a national basis, not subject to the vicissitudes, financial or otherwise, of local authorities? I am not overlooking the importance of the public-health aspect of the disease, but the clinical aspect is the more important. Moreover the coöperation with the public-health services should not be difficult to maintain.

I am, Sir, yours faithfully,

F. TEMPLE CLIVE,

Medical Supt., National Sanatorium, Benenden, Kent.

THE FUTURE OF CLINICAL TEACHING

SIR,—As Professor Ryle points out, men "like Bright, Addison, Gull, Wilks, and Fagge" have left their mark on clinical teaching. On those traditions Professor Ryle was trained and showed how good that training was in the last war, as I can testify. The war over, he soon makes his mark as a teacher and clinician in his school and aided by a flourishing "Harley Street" practice (despite its "spurious sanctity," whatever that may mean?) he rises to the top, and at a fitting stage in his career is translated to a high position in another university.

Professor Ryle is a good example of the existing system of medical education. I wonder if there was much wrong with the rungs of that ladder on which he climbed to comfort and security—and, I doubt not, prosperity—that he now wishes to kick that ladder down behind him? In the scheme that he puts forward there is much that is idealistic and almost utopian, but behind it all I seem to see a hidden hand and the spectre which hovered over the correspondence columns of THE LANCET not long since. This scheme would make things easier for the student and the teacher, and certainly very expensive for the State. I am not so sure about the private patient. Those who come to our consulting-rooms come quite often to unburden the cares of heart and mind as well as body. Many of these would not face the glare of publicity within hospital portals. I do not believe this war will see the end of the "Harley Street" consulting-room. If too many of the genuine consultants are carried off to salaried hospital service their places will soon be

filled by others, with less claim to the title, as they have been lately. While the bulk of the regular consultants have been cooling their heels in country hospitals quite a crop of strange names have appeared on plates and bearded foreign-looking gentlemen now haunt our nursing-homes.

I wonder, too, if the student, if and when he lives in the pocket of his teachers and becomes spoon-fed, will make any better practitioner than those we turn out now—self-reliant because partly self-taught under capable guidance. Should we make things too easy for them? Is it wise to give them an escalator instead of a ladder? And what about the teachers? Will the teachers in the new Utopia, who have not got to struggle to make good, outshine those of today? And what about the State? When this war is over, whether it is long or short, where is the money coming from to pay the pensions and the unemployed as well as the upkeep of the country? Is there a hope that funds will be found for such a scheme as Professor Ryle adumbrates? And if it is found, how long will it be before the State gets control? Is the profession at the present time enamoured of its experience in this direction? All will agree that it should be our earnest endeavour to continue to improve clinical education. It is 47 years since I became a medical student and ever since then I have been either student or teacher and consultant, and I have seen nothing but progress in clinical teaching.

I do not believe there are good grounds for the statement "that a decline in the standards of clinical teaching was already in process before the present crisis," nor do I think that Professor Ryle has made out a good case for this, though it would take too long to argue it. I believe that medical education in this country is not surpassed in any other (not even in Scandinavia) and I have no doubt it can be made better, as it has been year in and year out, since I can remember. If I live long enough to see this war ended I shall cease to be either teacher or consultant, so I can speak with no axe to grind. I do not doubt that my friend Ryle will write me down as an incorrigible Tory, but I do not want to see that stately edifice pulled down which has been built up on the solid foundations laid by Paget and men like him, and with it the collapse of great traditions, until I can be convinced that the glamorous sky-scraper that has been pictured is something very much better.

I am, Sir, yours faithfully,

Harley Street, W.1. C. GORDON-WATSON.

THE MIND OF HITLER

SIR,—I am a little surprised that no contributor to the recent controversy in THE LANCET concerning the mind of Hitler has drawn attention to the fact that once before in German history the son of a peasant became a leader of the German race and exhibited somewhat similar mental peculiarities.

Martin Luther also thought himself chosen by God for the task of liberating Germany. He, too, rose against constituted authority and set up his own in its stead. Moreover, he likewise could not brook opposition, covering his enemies with vulgar abuse rather than defeating them with sound argument. He once referred to Erasmus as a bug more stinking dead than alive. He was, like Hitler, often transported by rage and suffered from morbid fears and depressions in which he regarded himself as eternally damned. So far as we know, Hitler has not the same respect for the devil, but he certainly has many periods of strange gloom. "It is no longer a matter for patience, tolerance, or pity. It is the hour of wrath and the sword: the hour of mercy has passed." So wrote Luther in 1525 against the Peasants' War, but it might be Hitler barking in 1940.

Hitler, apparently, is not a convivial companion, and eschews women, while Luther liked both wenches and wine. It is almost the only important difference between these two, whose work is essentially the same—an attempt to destroy the settled order and traditions of Europe through German nationalism. Both are popular heroes: is there not something unhealthy about a people that so delights to honour the abnormal? I am, Sir, yours faithfully,

Lancing, Sussex. G. H. CRISP.

SIR,—There are many of Hitler's actions which might call for psychiatric explanation, but surely this of the *volte face* over the German-Soviet pact is not one of them. To me indeed Dr. William Brown's explanation far from illuminating the matter acts like a smoke screen, rendering obscure what was formerly clear. After all, we ourselves were more than toying with the idea of making the same *volte face*. Is that too unintelligible unless we assume psychosis in our Government; and if we do, does it make the matter more understandable? Last summer it did seem worth while both to us and to Hitler to get the potential weight of Russia on our respective sides. The fact that it was perhaps not worth having does not make the idea paranoid. We found that it was not worth having because we should have had to sacrifice our principles. To Hitler this presented no difficulty, but to be unprincipled is not the same thing as to be paranoid.

Following Dr. Dillon's appeal I would also urge Dr. Brown to point out the facts which made him change his mind about Hitler and degrade him from the status of therapist to that of patient. Many of us cannot see that Hitler has changed. I am specially puzzled by the fact that Dr. Brown has been studying his subject for seven years, with the inference that his present view is based on that steady, systematic study. Was Hitler a great therapist for the first four or five years, and did he then go off his head, or was the therapist period an interlude between two psychotic attacks or what?

I am, Sir, yours faithfully,

T. A. ROSS.

THE ADVISORY E.M.S. COMMITTEE

SIR,—Sir Ernest Graham-Little is a convinced if not a convincing controversialist. In a recent letter to the *Times* he proceeded, with a characteristic mixture of modesty and generosity, to divide the honours of the Emergency Medical Service between himself and that newspaper. He blamed the Central Medical War Committee for the original scheme. He attributed to an unnamed committee the credit for putting forward the proposals for reorganisation. As that letter did not produce the desired result, Sir Ernest now alleges that his efforts to secure a part-time grade of service for practitioners not enrolled in the consultant and specialist groups are being "thwarted by the now familiar tactics of shifting the responsibility to an unnamed committee." He seeks the return of his bouquet. One can understand his confusion of mind when he contemplates the many committees which have been associated at one time or another with the E.M.S., but he might have restrained his natural impulse to engage in public controversy until he had elucidated the facts—from the secretary of the Central Medical War Committee.

These are the facts. The Central Medical War Committee, after taking the advice of a special com-

mittee presided over by a prominent London consultant and group officer, advised the Ministry on the terms of service, part-time and full-time, which should be offered to medical practitioners recruited to the E.M.S. This was in July last. The Ministry itself, on the advice of its group officers, decided before the war that the majority of London consultants should be recruited on a whole-time basis. When it was found that the war had not turned out as most people, perhaps even including Sir Ernest Graham-Little, anticipated, this same Central Medical War Committee established a second special committee, including in its membership the presidents of the three Royal Colleges, to review an unexpected situation. This is Sir Ernest's "unnamed" commmittee. This body, now known as the Advisory E.M.S. Committee, has had referred to it by the Central Medical War Committee all matters in connexion with the E.M.S. It includes, in addition to the presidents of the three Royal Colleges, representatives of the Central Medical War Committee, group officers, and representative practitioners actually engaged in the work of that service. This was the body which put forward the proposal that, in the light of experience gained in the first few months of war, the majority of consultants should have the opportunity of transfer to a part-time basis. This proposal the Minister wisely accepted. This committee recently negotiated with the Ministry representatives payment for mileage, which will shortly be published. It has recommended to the Ministry the establishment of a new part-time grade of service to be open to certain of the practitioners now enrolled in the £550 grade. It is at present discussing with the Ministry a number of other problems which have arisen in connexion with this service.

Untroubled by a responsibility either for the original proposals or for those subsequently put forward, Sir Ernest Graham-Little need now have no difficulty in naming the Advisory E.M.S. Committee as the body to which the Central Medical War Committee has delegated the responsibility for presenting the profession's view on E.M.S. problems to the Ministry.

I am, Sir, yours faithfully,

G. C. ANDERSON,
Secretary, Central Medical War Committee.

B.M.A. House, W.C.1.

A FILING SERVICE IN FRANCE

SIR,—We read in your issue of Jan. 27 that the Royal College of Surgeons of England has decided to found a reference library in connexion with the unit in France. Your leading article expresses the wish that such a library would possibly be used as a regular clearing-house of information to answer medical questions put by medical officers on active service. May we inform you that the French medical periodical *Monde Médical* has since 1927, under the supervision of Dr. P. Astier, established such an information bureau. Under the name of *Les Fichiers du Monde Médical*. This filing service, which has classified over 2,000,000 references and more than 600,000 copies of medical articles, constitutes an international office of medical surgical documentation.

This service is open freely to any demand issued by the medical corps of any part of the world and is organised to send, in the minimum possible delay, valuable information regarding every branch of the medical science. In fact, over 60,000 demands, originating from Europe, Asia, Africa, America and Oceania, are satisfied yearly. May we recall the attention of all our British friends—seekers, practitioners, medical officers on active service somewhere in France—that we wish to devote ourselves to any of their demands and hope by doing so to tighten even more thoroughly than at present the scientific and human relations existing between our two sister-nations.

I am, Sir, yours faithfully,

H. DALBY,
Director.

Paris, 42 rue du Docteur-Blanche.

EXO-ERYTHROCYTIC STAGE OF MALARIA

SIR,—Your note on the exo-erythrocytic cycle of malaria parasites (*Lancet*, 1939, **2**, 968) gives due credit to Dr. S. P. James for having postulated most precisely the necessity of admitting a not yet known stage of development of the parasite in the reticuloendothelium. The facts that supported the theory had been already established by different authors, among them Raffaele, especially with regard to the non-infectiveness of the blood of birds for the first three days after inoculation. The first demonstration of the expected non-pigmented cycle was given by Raffaele in canary birds for *Pl. elongatum* and for *Pl. relictum* in the laboratory of this institute and his priority of such discovery is universally recognised. Valuable contributions to the knowledge of the non-pigmented cycle in birds were afterwards published by James, Tate, Kikuth and other authors, the name "exo-erythrocytic cycle" being proposed by James. In human malaria Raffaele has shown phases of this cycle for *Pl. vivax* and *falciparum*. The observations of Casini made also in this institute refer to *Pl. falciparum*.

I am, Sir, yours faithfully,

G. BASTIANELLI,
Director Marchiafava Institute of Malariology, Rome.

STUDENTS AND THE E.M.S.

SIR,—In your leading article of Jan. 6 you point out that students are no longer necessary to the E.M.S. scheme. Officially this has always been the case, as the position of students under the E.M.S. has never been defined. Though this is, of course, of convenience to the Ministry of Health it is of great inconvenience to the students as a whole, as they could not fail to find out during the last three months. Although the Minister of Health disclaims all responsibility towards medical students, he reserves the right, without any preformed plan, to call on them in an emergency. Again, under the present arrangement no provision is made for compensation to medical students injured while on M. of H. services, or for time lost from hospital studies for which they have to pay in the form of fees. Unless some more definite scheme is evolved the same muddle and waste of time will ensue as occurred last September. For these and other reasons a much more precise definition of the status of medical students must be given and a comprehensive scheme evolved *before* the emergency occurs if efficiency and collaboration are to be achieved.

I am, Sir, yours faithfully,

R. P. G. SANDON.

Medical Committee of the National Union of Students, 3, Endsleigh Street, London, W.C.1.

Surgeon Captain T. B. Dixon has been appointed an honorary physician to the King in succession to Surgeon Captain L. S. Ashcroft.

Dr. F. B. Byrom has been appointed postgraduate lecturer in pathology in the university and director of the pathology unit at Prince Henry Hospital, Sydney, New South Wales.

PARLIAMENT

ON THE FLOOR OF THE HOUSE

By MEDICUS, M.P.

THE House discussed Workmen's Compensation on Jan. 30 on a motion proposed by Mr. Arthur Greenwood calling for immediate action to increase the rates of compensation payable. This was moved in view of the fact that the existing maximum is 30*s*. a week and is often less, and that the Commission on Workmen's Compensation now sitting has intimated through its chairman that its task will be a lengthy one. It is possible that the commission itself is working with difficulty. Sir Arnold Wilson, in the uniform of a flight lieutenant of the R.A.F., moved an amendment urging "the Government to enter into discussion with representatives of industry with a view to devising a temporary scheme for meeting cases of hardship pending the receipt of the report of the Royal Commission." And this amendment was accepted somewhat half-heartedly by the Government, who evidently regarded it as a choice of evils. Mr. Greenwood compared the victims of industry with the victims of war and asked for an increase of payments as a matter of justice and not the treatment of special cases of hardship, for "hardship is the common lot of the mass of the people." It is certainly time something of a constructive kind and on a large scale was done for workmen injured in industry. As Sir Arnold Wilson reminded the House, there have been 21 debates on this subject in the House during the last seven years and he regretted "the years that the locusts have eaten" and said he did not pretend to understand why no action had been taken during those seven years. "The Stewart-Delevingne Committee was only the last of a number of dilatory committees whose leisurely reports were received but not acted on. . . ." Sir Arnold also reminded the House that by September, 1939, and as far as he knew up to the date of the debate the employers had not submitted their proof of evidence after more than a year's notice of the appointment of the Royal Commission. The T.U.C. managed to get their proof in before war broke out. Sir Arnold regarded flat-rate increases as unsuitable, but it was possible, he said, for the Government to undertake now negotiations with 20 or 30 groups of employers who would cover at least 80 per cent. of all accidents occurring in industry and 95 per cent. of all the more serious accidents. The amendment would also make it possible to provide for the free provision of medical treatment in serious cases and of artificial limbs and aids to locomotion which are provided for as a matter of course in the case of disabled warriors of the armed forces. The kernel of Sir Arnold's criticism, for his speech was very critical of the Government, was that the whole structure of workmen's compensation has been ruined in the past 20 years by the intervention of a third party, namely an insurance company, which is in no way interested in the ultimate interests of either master or man, but in giving the minimum of satisfaction to the man which the law requires, without any reference to the true needs of the case. It should be the first object of the legislature, said Sir Arnold, "to cure the man"; the second so far as might be to fit him for alternative employment and to find him that employment; and the third to provide such a scale of cash compensation, in the form of weekly payments, as would enable men to maintain their civil obligations, to maintain their families, if any, and to ensure that they or their relatives should not become a charge on the state. At present some thousands of injured men do become a charge on the state.

* * *

Sir Arnold Wilson drew attention also to the intention of the Act and of employers and the strict letter of the law as enforced by insurance companies. "In this respect," he said, "mutual insurance companies are not much better than the profit-making companies. I know one mutual with 9 per cent. debentures." In cases where disability extended to thirteen weeks a large proportion of cases became the subject of litigation, the figure given being 10 to 20 per cent. Sir Arnold wanted change brought about by direct negotiation between employers and employed, and as nine-tenths of all accidents affect the 7 to 8 million persons employed in the seven principal industries this should be possible.

Some interesting figures were given of the cost per head in compensation in certain industries. In mining it was 76*s*. 9*d*. or 3*d*. per ton of coal raised, the biggest figure of all. In docks it was 56*s*. per head; in shipping 34*s*. or 4½*d*. per ton of shipping not laid up; in quarries 31*s*.; railways 12*s*.; and factories 8*s*. 4*d*. A penny a week on wages would give an increase of 50 per cent. in compensation all round, and the entire cost of making the increase retrospective could be met by reducing the expense ratio of the accident offices. In 1922, when the Holman-Gregory Committee reported, they considered that this ratio should not be more than 40 per cent.; since 1923 it has been 37½ per cent. and Sir Arnold suggested the time had now come to bring it down to 30 per cent. Both mutual and accident offices are now getting much bigger sums in premiums than ever before because wages have been going up on which premiums are based. Men in industry are "no less vital to the conduct of the war than those on the battlefield or in the air."

* * *

Sir John Anderson, in announcing the Government's acceptance of the amendment, ruled out of immediate consideration the "very interesting suggestions with regard to the future development of workmen's compensation" Sir Arnold had made because they "would take time," but he proposed "something simple which can be brought into effect speedily" and hoped for "fruitful results." Mr. Peeke in winding up the debate for the Government agreed, under pressure, that there were "many cases of hardship—some harder than others," on which an Opposition member interjected "Not as hard as the Government" and this interjection fairly expressed the view of many in the House. There was so much feeling, in fact, and so many interjections that the Speaker had to intervene with the words "It is impossible to debate any subject in this way."

Mr. Peeke made it clear that the Government wished to consult the T.U.C. and the employers' organisations in order to consider some temporary scheme which would "meet cases of hardship to the best advantage." There was to be no means test and no contribution from the worker because the funds for compensation were provided by the employers. This is usually by insurance. But the Government could not redraft the whole workmen's compensation scheme at this stage. There were two divisions at the end of the debate, one for the Labour motion and one for the Arnold Wilson amendment. The Government had the majority in each case, on the first by

155 to 115 and on the second by 155 to 100. The numbers were smaller than they would have been because of weather conditions. But Sir Arnold Wilson voted in neither division.

FROM THE PRESS GALLERY

Workmen's Compensation

In the House of Commons on Jan. 30 Mr. ARTHUR GREENWOOD, on behalf of the Labour Opposition, moved that pending the report of the Royal Commission on Workmen's Compensation immediate action should be taken to deal with the urgent necessity for an all-round increase in the rates of compensation. Sir ARNOLD WILSON moved an amendment urging the Government to discuss with representatives of industry with a view to devising a temporary scheme for meeting cases of hardship. Sir JOHN ANDERSON, Home Secretary, pointed out that when the last war broke out workmen's compensation was on a basis of 50 per cent. of earnings for total disablement, subject to a limit of £1 a week. Today the limit was 30*s.* and the scale was not a flat one of 50 per cent. but a tapering scale from 75 per cent. for the poorer-paid workers down to 50 per cent. Action was not taken in the last war to increase rates until the cost of living had risen 75 points after more than two years of war. In August, 1917, when the rates were increased by 25 per cent., the cost of living was about the same as it was today. The cost of living when the present rates were fixed in 1923 was again about the same. Wages then were not materially different from what they were today. The case for alteration was a reflection of the defects in the existing scheme of compensation. In its origin workmen's compensation was not a scheme of social provision at all; it rested on a particular doctrine of liability and it was only by slow degrees, and to a limited extent, that an element of social provision came to be included. The chairman of the Commission had informed him that its task would be a lengthy one. Meanwhile the Government were prepared to accept Sir Arnold Wilson's amendment. —Mr. FOOT, speaking for the Opposition Liberals, suggested that it would be a vicious principle to distinguish between one case and another, as was proposed in the amendment. He hoped that when the Government considered bringing in amending legislation they would take into account certain obvious defects. First, the perfectly absurd rule of election: that if a man had elected to take his compensation payments he should lose his right to claim damages on account of an employer's negligence. Secondly, the Government should introduce a measure of compulsory insurance against claims of this kind. Thirdly, some alteration might be made in the position of the medical referee. It seemed wrong that in certain circumstances a doctor should be placed in the position of a judge. He was thinking particularly of the cases of workmen who believed that they were suffering from silicosis. In such a case the man's doctor might be of the opinion that he was suffering from the disease, but it might not be possible to get the necessary certificate from the medical referee. The doctor was merely an expert in his own line, and the decision of one doctor ought not to be final. It should be possible to try out the evidence of one medical witness against another before a properly constituted tribunal. Fourthly, the Government would remove a good deal of hardship and injustice if they got rid of the doctrine of common employment.—Sir ARNOLD WILSON'S amendment was carried.

Control of Food Prices

Replying to Mr. ATTLEE on Jan. 31, Sir JOHN SIMON, Chancellor of the Exchequer, announced the measures already taken and to be taken by the Government to hold retail prices of staple foods, or at any rate to impose delay and check the abruptness of any rise. At the outbreak of the war there was an immediate and inevitable rise in the cost of buying food abroad and of bringing it to this country. This initial rise was gradually reflected in an increase in retail prices in this country, and the cost of living index (in which food prices are the predominant factor) after standing at 155 at the beginning of September rose by 18 points, or more than 10 per cent., to 173 at the end of November. The cost of food index however remained quite steady between Dec. 1 and Jan. 1 for this reason. At the beginning of December further increases in food prices would have been found to be necessary if the working of the food control were not to involve a loss to the Exchequer. The Government then decided that the Exchequer should bear for the time being the loss involved in an endeavour to avoid these increases. It was due to this action that the cost-of-food index was unchanged between December and January. The policy of controlling retail food prices by the use of public funds was being continued and he anticipated that as a consequence any increase there might be during the present month in the cost of food controlled by the Government would be small. The cost to the Exchequer of this policy was at the rate of £1,000,000 a week, or say £50,000,000 a year, the cost arising principally from the holding of the prices of such articles as bread, flour, meat and milk. It would be unwise to assume that the Government could continue to shoulder an increasing burden as the result of a policy of avoiding increases in the cost of living. On the other hand, they were conscious of the grave disadvantages which would be entailed in any excessively marked or swift advances in prices of primary necessities, and they were anxious to do all that was practicable to avoid this.

QUESTION TIME

University Students and Military Service

Sir THOMAS MOORE asked the Secretary of State for Scotland whether he was satisfied that adequate arrangements had now been made to ensure that wherever possible university students were enabled to take their appropriate examinations before being called up for military service.—Mr. COLVILLE: I am informed by the Minister of Labour that the umpire, who is the final authority in this matter, has decided that a postponement certificate may be granted to a full-time university student if he has been studying for not less than a year for a critical examination which is due to be held within nine months of the date on which he was registered under the National Service (Armed Forces) Act. A critical examination is one which marks a critical point or determines a definite stage in a student's career.

Women Doctors in the Army

Sir FRANCIS FREMANTLE asked the Secretary of State for War if he would consider the advisability of appointing a senior woman medical officer to assist in meeting the needs of the large number of women employed by the Army. —Mr. OLIVER STANLEY replied: A number of women doctors, in some cases appointed to the R.A.M.C., in others employed as civil medical practitioners, are now rendering service to the Army, but the appointment of a senior woman medical officer is not at present considered necessary.

Sir F. FREMANTLE: Does not the Minister realise that a great deal of the policy and the arrangements for these women really must be in the hands of a senior woman medical officer who is able to understand the needs of women much better than men can do?—Mr. STANLEY: I do not entirely agree with the hon. member, who in his medical capacity was, I am sure, not unable to understand the needs of women; but certainly we shall have no hesitation in appointing a senior woman medical officer as soon as we consider it necessary.

Sir F. FREMANTLE: Will the right hon. gentleman also consider that I have feelings as a husband which makes me realise my inadequacy for advising on things about women?

VISCOUNTESS ASTOR: Is it not true that until you had a senior woman appointed at the War Office to look after the Women's Territorial Army you were getting into an awful mess?

Medical Treatment for the Shipwrecked

Mr. GRAHAM WHITE asked the Minister of Health if H.M. Government accepted responsibility for the immediate necessities required by shipwrecked men and women landed on our coasts as the result of enemy action.—Mr. ELLIOT replied: Any medical treatment which such persons may require will be provided at the cost of the Exchequer through the Emergency Medical Service. The responsibility for seeing that such necessities as clothing, food and shelter are provided will rest in the first instance with the county or county borough council of the area in which the shipwrecked persons are landed, but they may in practice be provided from other sources. In the great majority of cases expenditure so incurred by local authorities will be recoverable out of public funds.

Feet of Soldiers

Sir MURRAY SUETER asked the Secretary of State for War whether there existed a section of the Royal Army Medical Corps with properly trained chiropodists to look after the foot troubles of the troops; whether the medical director-general had conferred with the Joint Council of Chiropodists to ascertain their considered view on the best way to attend to the foot troubles of the troops; and whether he would consider forming an organised body to utilise existing establishments in towns in this country where chiropodial manipulative and massage treatment could be applied to members of H.M. forces who required such relief, as such a scheme would employ hundreds of men and women who were experienced in such work, and considerably lighten the work of any section of the R.A.M.C., where such type of treatment was applied and necessary.—Sir V. WARRENDER replied: No chiropody section of the R.A.M.C. exists. The treatment of foot defects in the Army is the responsibility of the regimental medical officer and under his direction are the regimental chiropodist and the instructor in physical training. The former is trained normally by the medical officer, and the latter is trained in remedial treatment of foot defects at the Army School of Physical Training. Training of regimental chiropodists is at present being carried out in certain military hospitals in each command, and further practical instruction is given under the direction of unit medical officers. The Director-General A.M.S. is discussing the whole question to-day with a deputation from the British Association of Chiropodists.

Nursery Centres

Mr. EDE asked the Minister of Health if he would substitute the education authority for the billeting authority as the appropriate authority to promote schemes for nursery centres in reception areas.—Mr. ELLIOT replied: The circular announcing the scheme suggested that the setting up of these centres in each appropriate reception area should be undertaken by an informal committee, consisting of representatives of the reception authority, the welfare authority, the local education authority and women's voluntary services for civil defence. Thus, every local authority and body in the reception area interested in the scheme will have a voice in making the necessary provision. It was decided to ask the billeting authority to finance the establishment and maintenance of the centres, primarily as a matter of administrative convenience.

Return of Evacuated Children to London

Replying to Dr. SUMMERSKILL, Mr. ELLIOT stated that the percentage of evacuated school-children who had returned to the L.C.C. area by Jan. 20 was 36·8.

The Penalty of Prophylaxis

Mr. LEACH asked the Secretary of State for War whether his department was receiving information regarding illness amongst the troops in Great Britain, Ireland, and the Channel Islands; whether he had been informed of the high percentage of men who had suffered from the effects of vaccination for small-pox and also from inoculation for typhoid fever; whether he was aware that in some instances inoculation against tetanus had caused high fever and general malaise; and whether, in view of the imperative necessity for the maintenance of the troops in good health, he would order medical officers to stop vaccinating and inoculating the men.—Mr. OLIVER STANLEY replied: The answer to the first part of the question is in the affirmative. The percentage of men who require treatment in hospital as a result of vaccination for small-pox is not high—some three to four per cent. These effects invariably occur amongst men who have not been vaccinated in infancy. With regard to inoculation against typhoid, a small proportion show reactions; for this reason, men are excused all duties for 48 hours following inoculation. Experience has shown that reactions following inoculation against tetanus are non-existent or negligible. These procedures, compulsory in other European armies, are designed to afford individual protection to the soldier and to prevent epidemic disease in the Army, and so to conserve man power. Except that a man is not accepted for a normal engagement in the Regular Army unless he consents to be vaccinated, all vaccination and inoculation is voluntary.

Young Persons on Night-work

Mr. GRAHAM WHITE asked the Home Secretary whether any permission had been given for young persons between the ages of 16 and 18 to be engaged in night-work; and, if so, in what types of manufacture they were employed and what were the numbers affected.—Sir JOHN ANDERSON replied: Emergency orders have been made authorising the employment of male young persons over sixteen at night in the case of 30 factories, of which 11 are engaged in the manufacture of aircraft or aircraft components, 4 in making wire ropes or cables, and 15 in more miscellaneous processes in the manufacture of armaments. In addition, orders have been made for 12 factories in the iron and steel and glass industries modifying or extending the circumstances in which night-work for male young persons was already permissible under the Factories Act in those industries. Information as to the number of young persons affected by these orders is not available. No orders have been made authorising the employment of female young persons at night.

Juvenile Delinquency

Captain PLUGGE asked the parliamentary secretary to the Board of Education whether his attention had been called to the possibility of an increase in juvenile delinquency in evacuated towns unless more adequate educational facilities were provided for the thousands of evacuated children who had returned; and whether he would make an inquiry into the extent of this danger and the means of meeting it.—Sir JOHN ANDERSON replied: My hon. friend has no doubt in mind the large increase in juvenile delinquency which occurred in the Great War 1914–18. From such inquiries as I have been able to make I am glad to say that so far there is no reason for serious anxiety on this score, in spite of conditions arising out of the war which might encourage youthful misbehaviour, including evacuation and the consequent disturbance of school life. Close touch is being maintained between the Home Office and the Board of Education on this matter and the position will continue to be carefully watched.

Judge or Medical Referee?

Mr. MUFF asked the Home Secretary whether his attention had been drawn to the observations of the county court judge for Hull, made on Jan. 15, on the administration of the Workmen's Compensation Act, and in favour of an amendment of the law; and if he would state the number of cases referred by the Hull county court to the medical referee, and the decisions resulting.—Sir JOHN ANDERSON replied: I have seen a newspaper cutting from which the judge would appear to have expressed sympathy with the view that medical questions should be more generally settled by the judge rather than by the medical referee. Judge Stewart's recent Committee on Workmen's Compensation expressed the contrary view; and the matter will now be considered further by the Royal Commission. I am informed that in 1939 there were 114 references to medical referees from the Hull county court. On many

of these the referee's decision is in the form of a report on the condition of the workman and it would be difficult to say, even after a detailed scrutiny of each case, precisely how far they were in favour of one side or the other; but I understand that, roughly speaking, 60 per cent. may be regarded as having been in favour of the workman.

Chickens and Eggs for Convalescents

Sir F. FREMANTLE asked the Minister of Agriculture whether it was the settled war-time policy of the Government to encourage the dispersal of the flocks of specialist poultry-keepers; and whether this was likely to increase the supply of eggs and poultry required for general consumption in the war.—Sir R. DORMAN-SMITH replied: A process of adjustment is inevitable under war-time conditions, and although there is likely to be some reduction in the output of eggs and poultry from specialist holdings, an increase of output is expected from other sources which should compensate to some extent for the decline from the former class.

Sir F. FREMANTLE: Does the Minister recognise that chickens and eggs are the basis of convalescent diet and that therefore they are required to a greater extent than in peace-time in case of really serious war casualties?—Sir R. DORMAN-SMITH: We have to try to utilise all our supplies of feeding-stuffs to the best possible advantage.

Price of Saccharin

Mr. THORNE asked the Chancellor of the Duchy of Lancaster the price of saccharin per hundred in August last and the price on Jan. 20.—Mr. LENNOX-BOYD replied: The general price charged for saccharin per hundred was 9½*d.* in August last and 1*s.* on Jan. 20. The increase in price corresponds to the increase in the excise duty imposed under the Finance (No. 2) Act, 1939.

OBITUARY

FRITZ DE QUERVAIN

M.D. BERNE

Professor de Quervain died in Berne on Jan. 24 suddenly from acute pancreatitis. With him passes a surgeon of international fame who was also a great Swiss. Fritz de Quervain was born in 1868 at Sion (Valais) of Huguenot stock which settled in Switzerland in 1668; his father was a protestant pastor of Bernese origin, his mother came from the Jura bernois. This accounts for his perfect command of both French and German. He studied medicine at Berne under Kocher, Sahli, and Langhans, and after

qualifying in 1892 he worked for a short time at the physiological institute under Kronecker. He then became clinical assistant to Kocher, whose chief interests at the moment were endemic goitre and its operative treatment. In 1894 he settled as a surgeon at La Chaux-de-Fonds, the centre of the watch industry in the Jura, where he drew patients from that populous district and the adjoining Franche-Comté in Burgundy. Despite a very large surgical practice he continued his scientific work and in 1902 he was appointed reader in surgery at Berne and produced the Encyclopædia of Surgery begun in collaboration with Kocher. In 1907 appeared his Surgical Diagnosis, which ran through nine German editions and was translated into many languages. In 1910 he was invited to direct the surgical clinic at Basle and he occupied this chair till 1918, when he succeeded Theodor Kocher at Berne. There he remained until 1938, when he reached the retiring age.

De Quervain was a fine clinical teacher, his diction was elegant and precise, his deductions always logical. From Kocher he inherited the painstaking technique which leaves nothing to chance. He set himself to ascertain the success of his operative work by critical statistical records and a careful follow-up. While his scientific interests were manifold, the study of everything concerned with goitre ran like a thread through his life. His monographs on goitre and on cretinism have become classical; with the social aspects of endemic goitre he dealt by founding the Swiss goitre commission, through whose work he popularised the importance of iodine as a preventive remedy. The introduction of iodised table-salt in most Swiss cantons was chiefly due to him. In 1926 he organised at Berne an international goitre congress. Surgical tuberculosis was another favourite theme; he was against any exclusive treatment, allotting to heliotherapy, X rays and operation each its proper share. But there is hardly a branch of surgery on which he has not left some valuable contribution; his almost encyclopædic knowledge included not only medicine but also the natural sciences. One of his last papers was on the contribution of Switzerland to the progress of medicine.

ALEXANDER DINGWALL-FORDYCE

M.D. EDIN., F.R.C.P.E.

THE death of Dr. Dingwall-Fordyce is a real loss to the movement in this country towards child welfare, for one of his plans reached the constructive stage. He was not only physician to the Liverpool child-guidance clinic but he controlled and coördinated there the work of psychologist, psychiatrist and social worker. As regards medical work for children he was totalitarian. In a letter written to a friend shortly before his death he said, "I think it should be made clear that a pædiatrician is the responsible person for the physical, intellectual and emotional welfare of the child—in other words, the whole child"—and he underlined the words intellectual and emotional. Nothing gave him greater pleasure than his election in 1933 to the presidency of the British Pædiatric Association. It may be idle now to speculate what he might have been had he obtained the post of medical officer for child welfare in Edinburgh for which he was an applicant in 1917. At all events if Edinburgh was the loser Liverpool was the gainer, for although in 1920 with poor prospects of consulting work in Edinburgh he accepted the post of lecturer in diseases of children at Liverpool University he never lost his early loyalty to the preventive side of his subject and to this nearly all his writings bear witness. The annual report of the clinic revealed him as deeply persuaded of the need for reform, striving for it, disappointed with what he himself had done and with the slowness of progress elsewhere, so that a kind of discontent breathed out from him in his

conversation; but there was nothing peevish or bitter or depressing about this side of him—it was something stimulating and salutary. He may perhaps be fairly placed among those who, in the words of an older epistoler, "died in faith, not having received the promises, but having seen them afar off, and were persuaded of them and embraced them."

Alexander Dingwall Fordyce came of a well-known Aberdeenshire family, although he was born in Edinburgh, studied and qualified there, and became assistant physician at the children's hospital and secretary of the College of Physicians before he crossed the border. At Liverpool besides the directorship already mentioned he was physician to the children's hospital and consulting physician to the open-air hospital at Leasowe and to a number of convalescent homes and welfare institutions. His writings included "Diet in Infancy" (with John Thomson); "Hygiene of Infancy and Childhood" (1910); "Diseases of Children" (2nd ed. 1921). He died in Liverpool on Jan. 7 at the age of 64, leaving a widow, a son and a daughter.

RICHARD HENSLOWE WELLINGTON

M.R.C.S., BARRISTER-AT-LAW

Dr. Wellington, who died in his 79th year at St. Leonards, on Jan. 23, was a staunch advocate of medical jurisprudence. He trained at St. Bartholomew's Hospital and qualified in 1891. He started his professional life in general practice, but inclined towards the law from the first. He ate his dinners at the Middle Temple and was called by that inn, and became lecturer on forensic medicine at Westminster Hospital medical school, where he laboured to improve the teaching and examinations in this important but neglected subject. At about the beginning of the century there was a general feeling that a medico-legal society was needed, and Dr. Wellington was one of the pioneers of the movement. With the late Dr. F. J. Smith he convened a meeting at 20, Hanover Square, the home of the old Medico-Chirurgical Society, and after discussion moved that a medico-legal society be started. Thus the society of that name came into being, with Sir William Collins as its first president. In 1904 Wellington, who with Dr. H. McCullin acted as hon. secretary, read a famous paper on "Suicide whilst temporarily insane—a legal contradiction." In this essay he put forward a view which he held strongly: that an insane person cannot commit a crime and therefore cannot commit suicide; and that few suicides are of unsound mind. He became greatly interested in the work of the coroner and an expert in coroner's law. He was a member of several deputations sent by the Medico-Legal Society to urge on successive Lords Chancellor the reform of coroner's law, which even then was much overdue. He published in 1904 his well-known text-book "The King's Coroner," in two volumes, and a second edition followed in 1906. Among his other writings were the valuable section on medicine and pharmacy in the first edition of Halsbury's Laws of England, and a history of the Medico-Legal Society. He became deputy coroner for the city and liberty of Westminster, and for the south-western division of the county of London. His ambition was to become a full coroner, and indeed his profound knowledge of the history, practice and procedure of the coroner's court seemed amply to qualify him for that office. He was, however, passed over more than once, and turned to public-health work. He became medical officer of health for Wisbech and later a medical assessor to the Ministry of Pensions and a member of the Lord Chancellor's pensions appeal tribunal. He was a forceful character, a faithful friend, and if at times brusque in manner his sterling integrity was unassailable.

HENRY GEORGE ARMSTRONG

M.R.C.S., L.S.A.

In the death of Dr. Henry Armstrong, which occurred at Lee on Jan. 19, at the age of 88, medicine has lost one of those pioneers who, following in Clement Dukes's footsteps, determined to make school-life healthy. Armstrong was the son of a clergyman and was born in Dublin in 1851. He was educated at Uppingham and Oxford, studying medicine at St. Thomas' Hospital where he qualified in 1874. After a short period as assistant surgeon at the Royal Berkshire Hospital, Reading, he became resident medical officer to Wellington College. For 35 years he held this appointment and many generations of old Wellingtonians will remember his care-free walk, his cheery whistle, and his gift for telling a story. He was a keen golfer and was one of the original founders of the East Berks club near the college; this venture followed an earlier experiment in laying out a course over the Big Side ground and school playing fields. Socially he was persona grata everywhere, and he will be missed by many of the college staff and by residents in the district of Crowthorne where he also practised. He wrote several papers on the incidence and control of various infectious diseases, and was a welcome speaker at meetings of Medical Officers of Schools Association. With Dr. J. M. Fortescue Brickdale he published a manual of Infectious Diseases occurring in Schools, which had, and still has, a considerable following in many preparatory schools. He married Annette Ethel, daughter of the Rev. F. C. Cardew, and leaves one son, now on service in Egypt.

Mr. Albert Samuel Worton, who died in London on Jan. 31 after an operation, was ophthalmic surgeon to the Princess Beatrice Hospital. Having qualified in Glasgow in 1895, he took his F.R.C.S. in 1909 and became chief clinical assistant at Moorfields under Mr. George Coats. During the late war he was attached to the Prince of Wales's Hospital and later joined the staff at the Princess Beatrice, working there until last Christmas. He was popular with his patients and had a large professional following among the practitioners in Earl's Court.

Surgeon Captain P. D. Ramsay, who died at the age of 62 at Plymouth on Jan. 30, was the only son of the late Paymaster-in-Chief Andrew John Ramsay, R.N., and brother of Dr. Mabel Ramsay. Educated at Plymouth College and St. Mary's Hospital, Paddington, he qualified in 1903 and the following year entered the Royal Navy, with which he served for over 26 years. In 1915 he was on board H.M.S. *Amethyst* when she made her famous dash to the Dardanelles to cut a cable. A fifth of her crew were lost, but Ramsay had a lucky escape when a shell went through the ship just over his head. Subsequently he served in the South American station and he went through the battle of the Falkland Islands. After the war Ramsay was appointed P.M.O. at the Royal Marine Barracks. He retired from the Navy ten years ago and joined the mercantile marine service as a medical officer to the Cunard and the Furness Withy lines.

MEDICAL NEWS

University of Cambridge

On Feb. 2 the following degrees were conferred :—

M.B., B.Chir.—G. D. Graham, A. C. C. Hughes, and Richard Wilson (by proxy); and T. B. Hutton.

University of Manchester

Dr. F. Wood Jones, F.R.S., has withdrawn his resignation of the chair of anatomy which was to have taken effect from Dec. 25. Dr. J. C. Dundon, has been appointed demonstrator in anatomy.

Scottish Conjoint Board

At recent examinations by the board of the Royal Colleges of Physicians and Surgeons of Edinburgh, and the Royal Faculty of Physicians and Surgeons of Glasgow the following were successful :

James Allan, Robert Anderson, Jacob Balkind, Samuel Barclay, J. C. Brown, George Buchanan, Julius Cinder, H. I. Clapham, A. C. Clark, R. F. Clark, Sidney Druce, G. K. Effat, D. M. Fairley, Cameron Fraser, S. A Gabrial, Philip Goldberg, Leon Goldstein, W. R. Grant, J. H. Higgins, J. E. Holland, H. W. Horne, K. G. Huxham, Benjamin Jacobs, M. M. Katz, J. D. Katzman, P. L. Khurana, G. B. Lamberty, D. K. Levin, B. R. Malhotra, A. A. Martin, P. G. Miller, Klaus Misch, M. A. L. Musa, A. M. McKinlay, Allen Newman, V. O. Nurse, F. G. Obeidallah, D. A. Patel, T. M. Prosser, H. J. Richardson, George Richmond, L. K. Rittenhouse, Dorcen M. Sang, L. E. Shapiro, J. B. Stafford, W. D. T. Sym, H. Q. O. Wheeler, and A. R. Widlitz.

The following graduates of recognised foreign universities were also admitted licentiates :—

Martin Bodian, B. C. Bose, Dorian Eisenklam, Karl Eisinger, E. B. Gold, Solomon Horowitz, George Maschanzker, K. F. Pollaczek, Josefine Stross, and Max Sugar.

Harveian Society of London

The annual general meeting of this society on Jan. 31 was followed by the Buckston Browne luncheon at the Langham Hotel and was well attended. The guests included Mr. Walter Elliot, Minister of Health, Mr. Hugh Lett, president of the Royal College of Surgeons, Dr. Fletcher Shaw, president of the Royal College of Obstetricians and Gynæcologists, and Sir Percival Nicholls, medical director-general of the Navy.

Dr. A. D. Morris, retiring president, proposing the toast of The Society, mentioned its determination to maintain its 100-year-old activity during the war. Prof. F. S. Langmead, newly elected president, in replying from the chair spoke of the generosity of Sir Buckston Browne which enabled the society to follow the Harveian tradition under which doctors meet together not only for the advancement of medicine but also in a convivial spirit. The Buckston Browne medal and prize were presented by the donor to Captain Robert Kemp for his essay on the value of periodic examination in the detection of disease in middle life, and Dr. James Aitken, who had been adjudged *proxime accessit*, was awarded a money prize. The president referred to the importance of the subject and emphasised the usefulness which would attend its publication, which he thought might reasonably be undertaken by an insurance company. Sir Buckston Browne spoke of his long association with the society, of his indebtedness to it and of the close interest which he took in its welfare.

Chadwick Lectures

On Feb. 20, at 26, Portland Place, London, W.1, Sir Arthur MacNalty will speak on the public health in war-time. On March 12, at the Livingstone Hall, 42, Broadway, S.W.1, Dr. T. N. V. Potts will discuss the rôle of women in the public health service to-day. On May 21, at the London School of Hygiene, Keppel Street, W.C.1, Prof. S. P. Bedson, F.R.S., will lecture on human virus infections of animal origin. All these lectures are at 2.30 P.M. On June 20, at 4 P.M., in the Chelsea Physic Garden, Swan Walk, S.W.3, Prof. William Brown, F.R.S., will speak on plant disease in relation to the public. Mr. William Hamlyn, F.R.I.B.A., will give the Bossom lecture on April 9, at 2.30 P.M., at 26, Portland Place. His subject will be the design, construction, and hygienic arrangement of camps. Further particulars of these lectures which are open to the public may be had from the secretary of the trust, 204, Abbey House, Westminster.

Pharmaceutical Society of Great Britain

On Tuesday, Feb. 13 at 7.30 P.M., at the house of the society, 17, Bloomsbury Square, London, W.C.1, Sir Walter Langdon-Brown will give a lecture entitled How Do Drugs Act ?

Druggists' Gifts for Earthquake Victims

The Anglo-Turkish Relief Committee announce that firms of druggists have contributed generously to the two tons of medical supplies which are already on their way to Turkey. Allen and Hanburys have sent 200 bottles of adrenalin; Aspro. Ltd. 150,000 Aspro tablets; Johnson and Sons a varied consignment, including 50,000 aspirins, 18 gallons of developer and fixer for X-ray films, 54 pounds of glycerin and 80 pounds of other drugs; British Drug Houses 5 gross pound-jars of Radio Malt; Marmite Food Extract Company 100 pounds of their product; and Evans Sons, Lescher and Webb, 200 tubes of tetanus antitoxin, each of 1000 units, 10,000 bottles of Streptocide and 30 gallons of Zant. Howard and Sons have sent a case of one-pound bottles of anæsthetic ether; Carnegie Brothers have supplied a variety of bandages; and Borax Consolidated Limited 224 pounds of powdered boric acid. In the first consignment of medical stores sent there are also surgical dressings, gauze, and cotton-wool, given by the Irish Red Cross Society. Further gifts will be welcomed at the depôt of the Anglo-Turkish Relief Committee, St. Thomas's Hospital, London, S.E.1.

Allocation of Doctors to the Services

The Central Medical War Committee has issued a circular letter explaining the working of the emergency machinery that the British Medical Association has set up at the request of the Government. Demands for doctors for the forces are received in the first instance by the central committee, who distribute them in the form of quotas amongst the local medical war committees, consideration being given to the proportion of doctors to population in each area. The local committees then proceed to make their allocations so as to interfere as little as possible with local medical services while following as much as possible the wishes of individual practitioners. Similarly demands for specialist medical personnel are received from the Services in numerical form, classified as physicians, surgeons, anæsthetists, dermatologists and venereologists, otologists, genito-urinary surgeons, hygienists, ophthalmologists, orthopædic surgeons, pathologists, physiotherapists, practitioners in psychological medicine and radiologists. Outside London the general procedure is the same as for other practitioners except that the Central Medical War Committee satisfies itself as to the specialists' qualifications and experience before recommending them for appointments. In London applications for specialist commissions are scrutinised by a committee of the Royal Colleges, known as the Committee of Reference. A special machinery, established in association with the Medical Research Council, exists to deal with the applications of pathologists for specialist appointments.

No practitioner is now allocated to the Services without his consent, and this arrangement will continue as long as the whole medical profession in included in the Ministry of Labour's list as a reserved occupation. If conscription is applied to any section of the profession it is anticipated that the local medical war committees will still be able to give regard to the wishes of practitioners.

Heavy demands for medical personnel for general duty with the forces are now being received from the service departments—the bulk of the demand comes from the War Office. Local medical war committees are now trying to satisfy the quotas that have been allocated to them by the central committee. Practitioners who are available for whole-time service at home or abroad with the R.A.M.C. are asked to intimate this fact, if they have not already done so, to the secretary of the local medical war committee for their area, or if in doubt to the Central Medical War Committee at B.M.A. House, Tavistock Square, W.C.1. The upper age limit is 50, although the greater need is for practitioners under 35.

More Appointments for Outpatients

Last year the managing committee of the Elizabeth Garrett Anderson Hospital decided to institute a system of outpatient appointments on the lines suggested in a pamphlet on the subject by Mr. A. G. L. Ives in 1938 after a visit to the Manchester Jewish Hospital. On the outbreak of war the outpatient department was closed but it reopened on Sept. 18, and the new system was brought into being.

All general practitioners who are in the habit of referring cases to this hospital were asked to write or telephone for appointments for the patients for whom they required an opinion. These requests are dealt with from 9.30 A.M. daily, and appointments between 9.30 A.M. and 3.30 P.M. are made for each member of the honorary staff attending the outpatient department. An interval of not more than one week may elapse between the application and the day fixed for the appointment, except in urgent cases. Subsequent appointments, if specialist treatment is advised, are given at the time of the first consultation. Patients who present themselves without doctors' letters are seen in the first instance in the casualty department, which has lately been opened, by a member of the resident staff who decides if the case should be referred to the honorary staff.

Socialist Medical Association

On Friday, Feb. 16, at 8 P.M., at the Small Conway Hall, Red Lion Square, London, W.C.1, Mr. Somerville Hastings will preside over a meeting of this association to discuss the war and the people's health. Admission will be free.

Ministry of Health

Mr. Walter Elliot has appointed Mr. K. McGregor to be an assistant secretary (acting) of the Ministry.

Medical Diary

Week beginning February 12

ROYAL COLLEGE OF PHYSICIANS, Pall Mall East, S.W.1.
TUESDAY and THURSDAY.—2.30 P.M., Dr. R. E. Smith: Acute Infectious Diseases at School. (Milroy lectures.)

ROYAL COLLEGE OF SURGEONS, Lincoln's Inn Fields, W.C.2.
MONDAY.—3 P.M., Mr. Michael Oldfield. Anatomy and Physiology of Speech.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole Street, W.1.
TUESDAY
Psychiatry: 2.15 P.M. Dr. C. J. C. Earl: The Clinical Use of Mental Tests. Dr. Kenneth Cameron will also speak.

ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE, 26 Portland Place, W.1.
THURSDAY
4.30 P.M., Prof. Warrington Yorke, F.R.C.P., F.R.S.: Recent Work on the Chemotherapy of Protozoal Infections.

TUBERCULOSIS ASSOCIATION, 26, Portland Place, London, W.1.
FRIDAY
4 P.M., council meeting. 5.10 P.M., Dr. P. M. D'Arcy Hart and Andrew Morland: The Value of Mass Radiography of the Chest.—8.10 P.M., Dr. S. Cochrane Shanks, and Mr. P. G. Sutton, M.S.R.: The Technical Problems connected with Mass Radiography of the Chest.

SOUTH-WEST LONDON MEDICAL SOCIETY
WEDNESDAY
3 P.M. (Bolingbroke Hospital, S.W.), Dr. Charles Newman: How is the General Practitioner affected by Modern Ideas about Nephritis?

BIOCHEMICAL SOCIETY
SATURDAY
2.30 P.M. (department of biochemistry, University of Sheffield), short communications.

TAVISTOCK CLINIC, Westfield College, Kidderpore Avenue, N.W.3.
MONDAY
3 P.M., Dr. Emanuel Miller: Biological Interpretation of the Neuroses. 4.15 P.M., Dr. Miller: Theories of Instinct.

BRITISH POSTGRADUATE MEDICAL SCHOOL, Ducane Road, W.12.
TUESDAY
Lord Horder: ward clinic.
WEDNESDAY
11.30 A.M., clinico-pathological conference (medical); 2 P.M., Dr. T. C. Stamp: Diagnosis of Typhoidal Disease; 3 P.M., clinico-pathological conference (surgical).
THURSDAY
2–4 P.M. Dr. Duncan White: radiological conference.
FRIDAY
2 P.M., clinico-pathological conference (gynæcological).
Daily 10 A.M.–4 P.M., medical clinics, surgical clinics and operations, obstetrical and gynæcological clinics and operations.

FELLOWSHIP OF MEDICINE AND POSTGRADUATE MEDICAL ASSOCIATION, 1, Wimpole Street, W.1.
Brompton Hospital, S.W.3.
MON. and THURS. 5 P.M.
M.R.C.P. course in chest diseases.
West End Hospital For Nervous Diseases
M.R.C.P. afternoon course in neurology.

Births, Marriages and Deaths

BIRTHS

ANDERSON.—On Feb. 3, at Cheltenham, the wife of Dr. R. G. Anderson—a daughter.
FLEMMING.—On Feb. 5, at Clifton, the wife of Dr. A. A. G. Flemming, Bradford-on-Avon—a daughter.
MONKHOUSE.—On Jan. 30, the wife of Dr. E. L. Monkhouse, Theydon Bois, Essex—a son.
MOYNIHAN.—On Jan. 29, at Ashwell, Herts, to Dr. Sheila Moynihan, the wife of Dr. J. H. Moynihan—a son.
PRYCE.—On Jan. 29, in London, the wife of Dr. D. M. Pryce—a daughter.
RICHARDS.—On Feb. 1, at Oxford, the wife of Dr. A. M. Richards—a daughter.
SEATON.—On Jan. 31, in Liverpool, the wife of Dr. Ronald Seaton—a son.
TENNENT.—On Feb. 1, at Northampton, the wife of Dr. Thomas Tennent—a daughter.
VAISEY.—On Jan. 31, at Lichfield, Staffs., the wife of Dr. A. W. Vaisey—a daughter.

MARRIAGES

WATTS—GEORGE.—On Jan. 29, at Chigwell Row, Essex, Harold Price Watts, M.B., to Eva George.

DEATHS

CHEATER.—On Jan. 31, at Brighton, George William Beaumleigh Cheater, M.B.Lond., aged 46.
CONYERS.—On Feb. 4, at Hove, James Hill Conyers, M.B.Edin., aged 75.
FARR.—On Jan. 28, at Staines, Ernest Farr, M.R.C.S., aged 79.
GLEGG.—On Feb. 4, at Haslemere, Wilfrid Glegg, M.D. Edin., M.R.C.P., honorary consulting surgeon to the Birmingham Ear and Throat Hospital, aged 66.
LILLEY.—On Feb. 4, at Hereford, James Harris Lilley, M.D. Camb., aged 85.
MAGGS.—On Feb. 6, at Bideford, William Adolphus Maggs, M.R.C.S., L.D.S., consulting dental surgeon to Guy's Hospital, aged 84.
PERRY.—On Feb. 5, at Headley Grange, Hants, Lieut.-Colonel Francis Frederic Perry, C.M.G., F.R.C.S., I.M.S. (retd.), late professor of surgery in the Lahore Medical College.
PIM.—On Feb. 1, at Beaminster, Dorset, Arthur Augustus Pim, F.R.C.S.E., aged 69.
RAMSAY.—On Jan. 30, at Plymouth, Surgeon Captain Palmer Devoy Ramsay, M.R.C.S., R.N. (retd.).
WORTON.—On Jan. 31, Albert Samuel Worton, M.D.Glasg., F.R.C.S.

The Lancet 100 Years Ago

Feb. 8, 1840, p. 743.

From an account of a woman pregnant with five children.

DOCTOR EVORY KENNEDY produced five fœtuses, with their involucra, the product of a single abortion, at the meeting of the Dublin Pathological Society, held on the 14th instant. . . . The specimen produced, Dr. Kennedy stated to be the multiparient conception of a female, who aborted when, as she stated, she was three months' gone with child. The case was one in which there appeared to be three distinct ova; two of these were twins, the third was single, so that five fœtuses co-existed in utero. . . . Some persons have been disposed to question the occurrence of these multiparous births; and indeed it must be acknowledged that the popular opinions, and even recorded cases, on the subject, are sufficiently extravagant; as for instance, the Countess of Hannenberg's case, in which it was stated that 365 children were produced at a birth. But without taxing our credulity in these cases too far, we have undoubtedly a few well-authenticated instances on record, in which women have given birth to five children at a time. One of these, that of Guiseppa Califani, occurred lately at Naples; and we have the details of another, which took place in Franklin County, in America, about twelve years ago, recorded by Doctor Paddock. There is also said to be a similar preparation in the British Museum. . . . In proof of the rarity of five twin-children, Doctor Kennedy further remarked, that out of 140,000 cases recorded in the Lying-in Hospital of Dublin, there is no instance of five children at a birth. There is one case of four, but none of five.

NOTES, COMMENTS AND ABSTRACTS

THE HAND OF THE SURGEON

By C. J. S. THOMPSON, M.B.E.

HON. CURATOR OF THE HISTORICAL COLLECTION AT THE MUSEUM OF THE ROYAL COLLEGE OF SURGEONS OF ENGLAND

THE hand that guides the instrument which may mean life or death to the patient has naturally been a subject of interest to those engaged in the practice of surgery from ancient times. In the Hippocratic writings we have the first allusion to the hand of the surgeon and are told of the importance the ancient Greeks attached to the instrument being adapted to the hand of the operator and also the means he should use to acquire dexterity and elegant manipulation. It is recommended that "the nails should be neither longer nor shorter than the points of the fingers and the surgeon should practise with the extremities of the fingers; the index finger being usually turned to the thumb. When using the entire hand it should be prone and when both hands they should be opposed to one another. It frequently promotes a dexterous use of the fingers when the space between them is large and when the thumb is opposed to the index. One should practise all sorts of work with either of them and together (for they are both alike) endeavouring to do them well, elegantly, quickly, without trouble and promptly."

The importance attached to the hand of the surgeon in the Middle Ages is evidenced in the works of Lanfrane, a pupil of William of Saliceto who brought Italian surgery to France in the thirteenth century. He himself was a great operator and he remarks that "a surgian must have handes wel-shapd, long small fyngers and his body not quakyng and all must be of subtle wit."

It seems a natural conclusion that a hand which is to carry out delicate operations should be finely formed, with long, sensitive and flexible fingers, but this conception is not invariably correct. Close observation of the hands of many surgeons famous in their own countries as operators, while attending various international gatherings, brought disillusionment, and the majority, it must be confessed, did not coincide with the preconceived idea of what a surgeon's hand should be. Instead of sensitive and tapering fingers with a finely formed palm, many of the hands were large and clumsy, with thick, short fingers and spatulate tips, apparently more suitable for stopping the strings of a violin than handling a delicate instrument. When discussing the subject with the late Dr. Harvey Cushing some years ago he said, with his whimsical smile, "I quite agree. From my observations I concluded that most of them were unspeakably awkward appendages and I only found two which I could call reasonably respectable." He told me that some time previously he also had been struck with the idea of making a collection of casts of surgeons' hands when he was at the Peter Bent Brigham Hospital in Boston. His collection, which included casts of the hands of W. W. Keen, William Mayo, Putti, Bastianelli, G. W. Crile and W. P. Graves, were later deposited in the Warren Museum at the Harvard medical school.

I was led to the idea of forming such a collection for the museum of the Royal College of Surgeons after visiting the anatomical section of Edinburgh University many years ago, when I was attracted by a hand, carved in marble, holding a scalpel. It proved to be the hand of James Syme, professor of surgery at Edinburgh between 1799 and 1876, and regarded as one of the boldest and most successful operators of his time. One of Syme's most ardent disciples was Joseph Lister, who was his house-surgeon in Edinburgh and married his daughter, Agnes. A study of Syme's hand in marble was made by Brodie, the famous Scottish sculptor, and a cast was made for Dr. John Brown, the author of "Rab and his friends," who gave it to Lister. This cast, through the kindness of Prof. Alexander Miles, has now been added to the collection. Another important addition to the collection was a radiogram of the hand of Lord Lister made at King's College Hospital, which is believed to be unique, and was presented by Mr. Cecil P. G. Wakeley, F.R.C.S. From the bony structure a good idea of the size and shape of his hand may be formed. Where casts were unobtainable, photographs have been substituted when possible, and among these excellent prints have been added of the hands of Lord Moynihan and Sir Mayo Robson.

In fulfilment of a promise made to me by Harvey Cushing shortly before his death, a cast of his hand has now been received for the collection. It is a replica in bronze of the one he had made in Boston and is characteristic of the man. The fingers are small and short with broad tips but are well-spaced, and it is interesting to compare it with the hand of James Syme. Syme's hand, with its slender tapering fingers and small nails, measures 9 in. in length. The index finger is 4 in. long and the palm 3¼ in. wide. In contrast with this, the length of Harvey Cushing's hand is 7½ in. only, and the index finger 3¾ in. long, while the palm measures 3½ in. across.

It is hoped that this brief description of a few of the specimens will arouse further interest in the study of the hand of the surgeon and induce others to add to the collection.

SOCIAL HYGIENE

SPEAKING from the chair at a meeting of the British Social Hygiene Council on Jan. 29, Sir Walter Langdon-Brown said that the work of the council assumed a new importance in war-time. The prevalence of venereal diseases in the defence forces was not comparable to that in the early stages of the last war, but certain treatment centres had already reported material increases in new cases—in one an increase of 60 per cent. of new cases of syphilis during 1939. On the other hand, certain clinics, particularly in evacuation areas which were not ports or defence force stations, showed a fall. The delay in the issue of the promised circular[1] by the Ministry of Health had checked the provision of additional treatment by local authorities. The North Riding of Yorkshire was carrying an additional population of 60,000 and there were no clinics nearer than Newcastle. Northumberland was also closely populated both by defence units and evacuees, and every case had to be referred to Newcastle. There was special need for trained almoners to be appointed to treatment centres, to get in touch with contacts and to provide machinery for following them up. For this to be done effectively there must be a clarification of the law of libel, extending privilege to communications between medical officers of the defence forces and civil medical officers, and between the director of a treatment clinic and the almoner. Young girls between 14 and 18 years of

1. This circular, No. 1956, was issued on the day of the meeting and was summarised on p. 248 of THE LANCET of Feb. 3.

age gathered round the defence force units and the dock areas in a dangerous and undesirable manner; another problem was to provide reasonable opportunities for these girls to meet the men under supervised conditions.

Dr. Otto May proposed a resolution urging the necessity of immediate and comprehensive measures to give proper knowledge to adolescents and young adults in order that the progress in the reduction of venereal disease, brought about during the past twenty-five years, should be maintained. Captain G. S. Elliston, M.P., in seconding the resolution, said that in the circular on venereal diseases issued by the Ministry of Health the local authorities were recommended to consider the employment of the expert services of the council, but no word was said as to the cost involved nor was any encouragement given that local authorities could look for assistance to the Treasury. Captain Elliston said that the parliamentary committee of the council had decided to represent to the Minister that trained V.D. almoners were essential to the effective working of the voluntary scheme of treatment, and would recommend as a war measure that they should be protected against the law of libel.

Dr. M. T. Morgan, medical officer for the Port of London, referring to the dangers besetting the men of merchant ships at ports, said that these did not exist in London; where they did exist they should be drastically dealt with in such a way as to avoid the necessity of regimentation of the merchant navy. The success of treatment clinics depended almost entirely on absolute secrecy, and the council should consider this before urging the appointment of almoners. Dr. May, in reply, said that where almoners were employed they seemed to be acting with great success and there was no trouble about breaches of confidence. The resolution was carried, and a further resolution was adopted expressing the council's disappointment at the lack of provision for Treasury assistance to local authorities in the Ministry of Health circular.

LIVERPOOL SCHOOL OF TROPICAL MEDICINE

THE annual report of the Incorporated Liverpool School of Tropical Medicine for 1938–39 records steady progress. The number of students attending the courses for the diplomas in Tropical Medicine and Hygiene has risen to 61. Increased teaching and research demanded more space, and the remaining part of the architect's original design is now being added to the school building at a cost of £7000. It is hoped that this extension will be completed early in 1940. In the department of tropical medicine investigations on the chemotherapy of protozoal infections have proceeded actively with the coöperation of the Medical Research Council and Messrs. May and Baker; experiments have also been conducted on the Machado reaction in South American trypanosomiasis. With a view to tracing the movements of insects the department of entomology has been making experiments on the persistence of dye substances in insects, and it is investigating the essential foodstuffs necessary for the growth of mosquito larvæ. The research laboratory in Sierra Leone carried out a mosquito survey of the protectorate and another survey in connexion with an outbreak of sleeping sickness; it has also experimented on the isolation of murine typhus from local wild rats.

NAVAL MEDICAL COMPASSIONATE FUND.—At the quarterly meeting of the directors of the fund, held on Jan. 26, with Surgeon Vice-Admiral Sir Percival Nicholls, the medical director-general of the Navy in the chair, the sum of £116 10s. was distributed among the several applicants.

NEW PREPARATIONS

NEO-PEPSAC.—Cachets of a highly concentrated and tasteless fraction of hog's stomach have been introduced by Boots Pure Drug Co., Nottingham, as a suitable form in which to administer stomach substances either alone or in addition to liver therapy in cases of pernicious anæmia. The brand name Neopepsac has been adopted.

KAPILON.—Under this name Glaxo Laboratories Ltd., Greenford, Middlesex, have introduced 1 c.cm. ampoules each containing 5 mg. of 2-methyl-1 : 4-naphthoquinone, an analogue of vitamin K which appears to be about four times as potent as vitamin K_1. Good results in excessive bleeding during and after operation on patients with obstructive jaundice and in hæmorrhage of the newborn have been reported after the administration of the compound. At present Kapilon is issued in ampoules suitable for injection, but when necessary the contents of an ampoule may be given by mouth.

FERRÆMIA TABLETS.—The constituents of these tablets, prepared by Wilcox, Jozeau and Co. Ltd. (74, White Lion Street, London, N.1), are ferrous sulphate, yeast, copper, and manganese. The copper, it is said, catalyses the conversion of iron into hæmoglobin, and the manganese is an adjuvant to copper in the mobilisation of iron in the body. The tablets are chocolate coated, so that the possibility of loss of efficiency by oxidation is avoided and the taste of iron completely masked.

Appointments

CUBIE, ALEXANDER, M.B. Glasg., D.P.H., assistant tuberculosis officer for the North Riding of Yorkshire.

GRAVESON, G. S., M.B. Camb., chief clinical assistant in the department of clinical investigations at Manchester Royal Infirmary.

LANGFORD, FRANK, M.B. Brist., F.R.C.S., D.P.H., deputy county medical officer of health and deputy school medical officer for East Sussex.

LEE, J. E. WILSON, M.B. Glasg., senior assistant radiologist to St. Mary's Hospital, Paddington.

Examining Surgeon under the Factories Act, 1937: Dr. R. D. BUCKNER (Newport district, Monmouthshire).

Vacancies

Aberdeen Royal Infirmary.—Res. med. reg., £200.

Agricultural Research Council.—Bacteriologist, £750–£1000.

Barbados General Hosp.—Radiologist, £800.

Birmingham United Hosp.—H.S. to special depts. and res. anæsthetist, at rate of £70.

Bolingbroke Hosp., Wandsworth Common, S.W. 11.—Cas. O., at rate of £120.

*Central London Throat, Nose and Ear Hosp., Gray's Inn Road, W.C.*1.—Res. H.S., at rate of £75.

Derbyshire County Council.—Jun. res. asst. M.O. for Derbyshire County Sanatorium, £350.

Essex County Hosp., Broomfield.—Sen. A.M.O., £550. Also third A.M.O., £350.

Grimsby County Borough.—Res. M.O. for Scartho Road Infirmary, £350.

*Hampstead General Hosp., Hampstead, N.W.*3.—H.S., at rate of £100.

*Hampstead General Hosp., Haverstock Hill, N.W.*3.—Res. cas. surg. O. for out-patient dept., at rate of £100.

Manchester, Christie Hosp. and Holt Radium Institute, Withington.—Sen. and jun. res. surg. O.'s, each at rate of £150.

Manchester, Duchess of York Hosp. for Babies.—Jun. res. M.O., at rate of £75.

Manchester Royal Eye Hosp.—Jun. H.S., £120.

Nottingham Children's Hosp.—Res. H.P. and res. H.S., each at rate of £150.

Oswestry, Robert Jones and Angus Hunt Orthopædic Hosp.—R.S.O., £350.

Portsmouth City.—R.M.O. and asst. M.O.H., £500.

*Royal Cancer Hosp., Fulham Road, S.W.*3.—H.S., at rate of £100.

Royal National Orthopædic Hosp.—H.S., at rate of £200.

Sheffield, Jessop Hosp. for Women.—Res. M.O., at rate of £150.

*South London Hosp. for Women, Clapham Common, S.W.*4.—Dental surgeon, £25.

Staffordshire County Council.—Asst. M.O. for maternity and child welfare, £600.

Staffordshire, Wolverhampton and Dudley Joint Board for Tuberculosis.—Asst. tub. O., £600.

St. Helens County Borough.—Asst. M.O. for A.R.P., at rate of £600.

*Westminster Hosp., St. John's Gardens, S.W.*1.—Physician.

Wolverhampton Royal Hosp.—Res. asst. pathologist and res. M.O., £200.

Wrexham Borough.—Part-time asst. M.O. and asst. M.O. for maternity and child welfare, £250.

The Chief Inspector of Factories announces vacant appointments for examining surgeons at Swanscombe, Kent; Stromness, Orkney; and Deddington, Oxford.